

# Fitting in or breaking free? : on health behavior, social norms and conformity

## Citation for published version (APA):

Mollen, S. (2013). Fitting in or breaking free? : on health behavior, social norms and conformity. Maastricht: Maastricht University.

## Document status and date:

Published: 01/01/2013

## Document Version:

Publisher's PDF, also known as Version of record

## Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

[Link to publication](#)

## General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal.

If the publication is distributed under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license above, please follow below link for the End User Agreement:

[www.umlib.nl/taverne-license](http://www.umlib.nl/taverne-license)

## Take down policy

If you believe that this document breaches copyright please contact us at:

[repository@maastrichtuniversity.nl](mailto:repository@maastrichtuniversity.nl)

providing details and we will investigate your claim.

# FITTING IN OR BREAKING FREE?

ON HEALTH BEHAVIOR, SOCIAL NORMS AND CONFORMITY

## COLOPHON

© 2013, Saartje Mollen, Maastricht, the Netherlands

Graphic design and layout by Suzanne van Rest

Printed by GVO drukkers & vormgevers B.V. | Ponsen & Looijen

All rights are reserved. No part of this publication may be reproduced, stored in a retrieval system transmitted in any form, or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the permission of the author.

The research presented in this dissertation was funded by ZonMw.



# FITTING IN OR BREAKING FREE?

## ON HEALTH BEHAVIOR, SOCIAL NORMS AND CONFORMITY

PROEFSCHRIFT

Ter verkrijging van de graad van doctor aan de Universiteit Maastricht, op gezag  
van de Rector Magnificus Prof. dr. Luc Soete, volgens het besluit van het College  
van Decanen, in het openbaar te verdedigen op  
vrijdag 25 januari om 12:00

door

SAARTJE MOLLEN

Geboren op 13 maart 1983  
te Valkenswaard

## **PROMOTORES**

Prof. dr. R. A. C. Ruiter

Prof. dr. G. Kok

## **COPROMOTOR**

Dr. R. N. Rimal (Johns Hopkins University)

## **BEOORDELINGSCOMMISSIE**

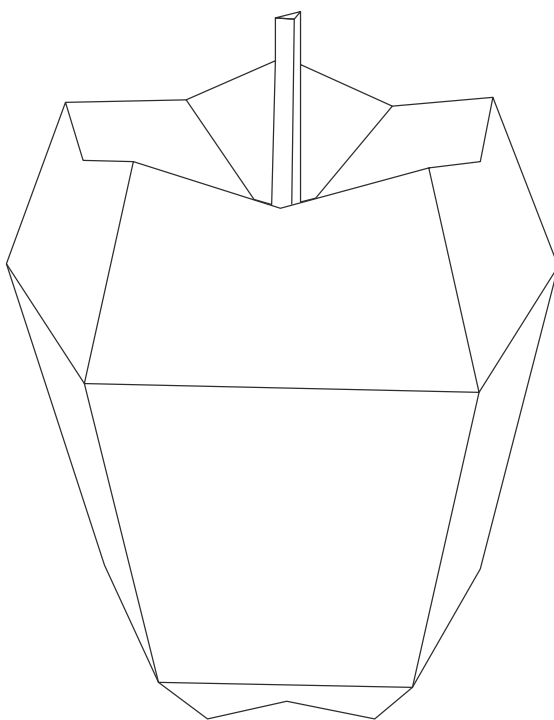
Prof. dr. A. T. M. Jansen (voorzitter)

Prof. dr. L. Maes (Universiteit Gent)

Dr. R. M. Meertens

Dr. B. van den Putte (Universiteit van Amsterdam)

Prof. dr. N. K. de Vries





## TABLE OF CONTENTS

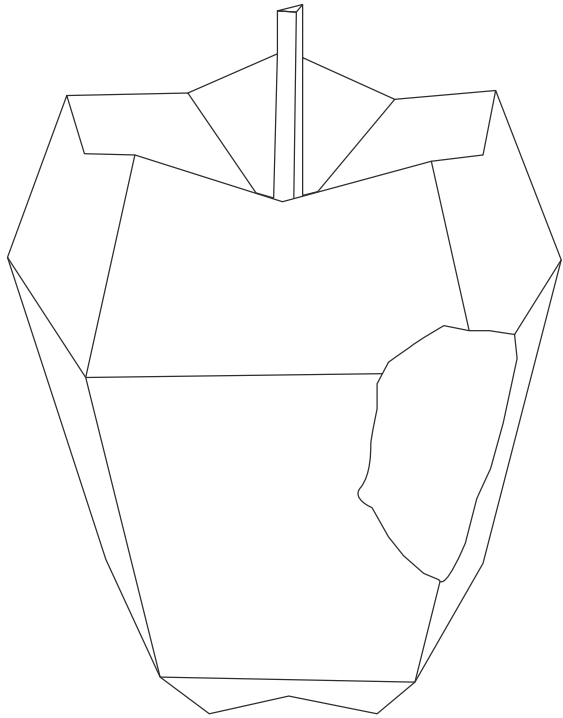
Chapter 1	INTRODUCTION	1
Chapter 2	DECISION-MAKING IN UNHEALTHY SOCIAL ENVIRONMENTS: THE EFFECTS OF DESCRIPTIVE NORMS ON DAILY HEALTH BEHAVIORS	15
Chapter 3	HEALTHY AND UNHEALTHY SOCIAL NORMS AND FOOD SELECTION: FINDINGS FROM A FIELD-EXPERIMENT	33
Chapter 4	INTERVENING OR INTERFERING? THE INFLUENCE OF INJUNCTIVE AND DESCRIPTIVE NORMS ON PROTECTIVE BEHAVIORS IN ALCOHOL CONSUMPTION CONTEXTS	51
Chapter 5	WHEN THE FRAME FITS THE SOCIAL PICTURE THE DIFFERENTIAL EFFECTS OF POSITIVE AND NEGATIVE FRAMING ON INJUNCTIVE AND DESCRIPTIVE SOCIAL NORMS	73
Chapter 6	GENERAL DISCUSSION	93
Summary		115
Samenvatting		125
References		135
Dankwoord		147
Curriculum Vitae		153





# CHAPTER 1

## INTRODUCTION



An adapted version of this chapter has been published as:

Mollen, S., Ruiter, R. A. C., & Kok, G. (2010). Current issues and new directions in Psychology and Health: What are the oughts? The adverse effects of using social norms in health communication. *Psychology & Health*, 25, 265 - 270.



*“Nine out of ten people eat less than the recommended two hundred grams of vegetables and two pieces of fruit a day” (Stichting Voedingscentrum Nederland, 2008).*

*“According to research, the average person in the UK eats less than 3 portions of fruit and vegetables a day instead of the recommended 5.” (National Health Service, 2004)*

In prevention practice, there is an understandable, yet erroneous, tendency to try to encourage action against a health problem by depicting the unhealthy behavior as regrettably frequent. Information campaigns - like in the examples presented above - emphasize that alcohol and drug use is intolerably high and that obesity rates are alarming. Although the aim of these messages is to promote a healthier lifestyle and positive behavior change by informing people that these health issues are serious matters in need of attention, from a social influence perspective, such messages actually enforce the notion that behaving in an unhealthy way is normal. Of course, the mistake is understandable: it is precisely the prevalence of the problem that gives it priority and puts it on the political and funding agenda.

Messages conveying that a majority of people behave in an unhealthful manner might not reach the intended effect, because among those of us who do not exhibit the desired health behavior, such messages might not provide any reason to change and among those of us who do seek to live healthily, the desire to conform to, rather than deviate from others may reduce the motivation to exhibit the desired health behavior. Additionally, even if we would want to resist unhealthy influences from our social environment, we might not be able to do so, as social influence oftentimes goes unnoticed. The main aim within this thesis therefore was to uncover the potentially adverse effects of messages conveying that a majority acts in an undesirable way, as well as offer avenues for more effective use of social norms in health communications messages.

## **SOCIAL PROOF**

For everyone who has ever seen a documentary on African wildlife the following image should resonate with them very clearly: Herds of wildebeests feeding on short grasses and bushes on the Serengeti plains that appear to be grazing calmly as if no danger is looming. A hungry lioness is closing in on the herd and gets ready to attack. She starts running and as she does, so do the first wildebeests that have spotted her. In

response to this the rest of the herd starts running without ever having seen the lioness. They simply follow the others and make their escape. Humans and wildebeests are not very different in this respect. We tend to follow others and usually do so with good reason. Like on the Serengeti plains where a herd of running wildebeests means that predators are nearby, ordering a popular dish in a restaurant you have not previously visited likely means that you will enjoy a tasty meal.

The behavior of most others (i.e., descriptive norm) is thought to guide our behavior because of the implied social proof, the rationale here being: “if most others are doing it, then it must be the right thing to do” (Cialdini, Reno, & Kallgren, 1990; Cialdini & Trost, 1998). Descriptive norms provide us with information and with that serve our goal to make accurate decisions (Cialdini & Trost, 1998; Jacobson, Mortensen, & Cialdini, 2011). Therefore whenever we find ourselves in a new or ambiguous situation, and we are not sure of the right course of action or response, it is wise to observe how other people act in that same environment. If most people in that situation act similarly, we would likely be inclined to consider this social proof that how they act is the appropriate way to conduct ourselves in that situation. In support of this idea, several studies have indeed found that descriptive norms are especially influential in situations that are unfamiliar, uncertain or ambiguous (Deutsch & Gerard, 1955; Griskevicius, Goldstein, Mortensen, Cialdini, & Kenrick, 2006; Tesser, Campbell, & Mickler, 1983).

Conforming to descriptive norms can offer clear advantages, such as not being eaten by a hungry lioness, or having a tasty meal in an unfamiliar restaurant. Descriptive norms provide us with information and it is because of that we often follow others without thinking twice; they can be seen as shortcuts or heuristics in the decision-making process (Cialdini, 1984). Recent research supports this notion, as it provides evidence that descriptive norms are more influential under conditions of low cognitive activity (Jacobson et al., 2011).

Although we may not be willing to admit it, the behavior of others in our social environment strongly influences the way we behave. In a study on environmental concern participants were asked to indicate how much they thought information on energy saving provided to them, motivated them to conserve energy (Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008). Participants who had received descriptive normative information, thus information on what others do, reported being motivated by the information significantly less than the participants who received information about environmental conditions or their social responsibility to save energy.

Interestingly, when it came to actual behavior, the normative information proved to be more powerful in changing behavior compared to the combined other conditions (i.e., environmental protection, social responsibility, self-interest and information control group). This means that we are either unwilling to admit that others influence our choices, or that norms influence our behavior outside of our conscious awareness.

That norms of conduct can influence our behavior even without conscious awareness is demonstrated by a series of experiments by Aarts and Dijksterhuis (2003). They investigated whether in certain situations norms can become automatically activated and subsequently trigger action. They showed that when the goal of going to the library was activated, participants responded faster to words representing the normative behavior associated with being in a library (e.g., quiet, silent and whisper) and actually lowered their voices in a read-aloud task. In another experiment, they found that when the goal of visiting an exclusive restaurant was activated, participants also acted in accordance with the appropriate norm of that context, namely behaving well mannered.

The tendency to perceive the behavior of others as appropriate behavior in a given situation is generally an adaptive response. However, we must acknowledge that when social norms are used as shortcuts in decision-making processes, their influence on behavior becomes automatic and reflexive. This automaticity, in turn, makes it harder to be aware of and protect oneself from negative social influence (Cialdini, 1984). This means that even though we may want to resist negative influences from the social environment, we might not always be able to do so. Therefore, assuming that health behavior change will result from a message conveying that a majority acts in an undesirable way might not be realistic, as normative influence may often go unnoticed.

In line with the idea that descriptive norms can adversely affect behavior, a series of studies by Cialdini, Reno and Kallgren (1990) showed that littering was heavily influenced by other people's behavior. In a parking garage, researchers placed large handbills under the windshield wipers of parked cars. Upon the car owners return to his or her car they monitored whether or not the handbill was littered. The researchers manipulated the descriptive norm by either creating a heavily littered environment (i.e., negative descriptive norm), or a completely clean environment (i.e., positive descriptive norm). In addition to that a confederate was in the parking garage and either littered one of the handbills while walking by, to increase norm salience (i.e., focus), or merely walked by. They found that the overall percentage of littering was 41% in the littered environment, opposed to 11% in the clean environment. The

percentage of littering was even higher when the negative descriptive norm was in focus, 54% of people littered when the confederate littered, opposed to 32% when the confederate merely walked by. These findings indicate that the communication of unhealthy norms of conduct like “Nine out of ten people eat less than the recommended two hundred grams of vegetables and two pieces of fruit a day” (Stichting Voedingscentrum Nederland, 2008) might be counterproductive. In Chapters 2 through 4 this assumption is tested.

## **THEORETICAL PERSPECTIVES ON NORMATIVE INFLUENCE AND HEALTH BEHAVIOR**

Influence from the social environment has quite rightfully been given a role in several explanatory models of human behavior. For instance, *Social Cognitive Theory* (Bandura, 1986), in which a person’s (social) environment is one of three reciprocal determinants of behavior change. Another influential behavioral model that includes social influence is the *Theory of Planned Behavior* (TPB; Ajzen, 1985). According to the TPB, behavior is guided by three main determinants, namely attitudes, control factors and subjective norms.

Attitudes pertain to positive or negative evaluations of a certain behavior. Control factors are perceptions of ability to perform a certain action. Subjective norms are perceived social pressures to perform a certain behavior and include beliefs about the approval of others’ related to a certain behavior (i.e., injunctive norm), as well as the prevalence of that behavior (i.e., descriptive norm). Initially subjective norms mainly referred to injunctive norms, but descriptive norms were later added, as they were found to significantly increase the amount of variance explained in the model (Rivis & Sheeran, 2003). The reference group with a subjective norm is typically someone’s close social environment, such as friends and family. Subjective norms (i.e., injunctive, descriptive) together with attitudes and perceptions of control are thought to determine the extent to which you intend to engage in a certain behavior. Intention, in turn, determines actual behavior (Ajzen, 1985). A large proportion of research conducted on the influence of norms on health behavior has been conducted within the framework of the TPB.

Several meta-analyses and reviews have been conducted into the predictive power of TPB determinants on health behavior. Godin and Kok (1996) found that the average correlation of subjective norms on intentions related to the performance of different health behaviors was 0.34, ranging from an average correlation 0.48 for driving to 0.16

for behaviors related to eating. Subjective norms were also found to influence intentions to engage in detection behaviors, such as cancer screening ( $r^+ = .41$ ). Specifically with regard to descriptive norms Sheeran and Taylor (1999) found a moderate correlation between descriptive norms and intentions to use condoms ( $r^+ = .37$ ). For ecstasy use a strong positive relation with descriptive norms was found ( $r^+ = .62$ ) (Peters, Kok, & Abraham, 2008). These meta-analytical and review findings illustrate that depending on the type of health behavior descriptive norms can have a moderate to strong influence on decisions to engage in healthy or unhealthy behaviors (Cohen, 1992).

The general approach to test the TPB model is to administer self-report questionnaires that assess the determinants of intentions (i.e., attitude, perceived behavioral control, subjective norm). This means that norms within the TPB do not reflect actual norms, but perceptions of those norms and that it is actually norm perceptions that influence intentions and subsequent behavior, not actual norms. However, norm perceptions can diverge from actual norms. It has been found that people often harbor inflated conceptions of the prevalence of unhealthy behaviors in their social environment (Borsari & Carey, 2001, 2003; Perkins & Berkowitz, 1986). The *social norms approach* is an intervention strategy that aims to reduce unhealthy behaviors (mainly applied to drinking among college students) by correcting normative misperceptions. This is done through messages that communicate that most students either do not drink, or drink responsibly (Perkins & Berkowitz, 1986). The communication of lower drinking norms is thought to offset overestimations of drinking behavior among students and create new norms that will in turn guide alcohol consumption. This intervention method is so popular that about 48 percent of all 4-year residential colleges and universities in the U.S. have tried this approach (Wechsler et al., 2003). The results from these interventions however have been mixed, while some have proven to be successful (e.g., DeJong et al., 2006; Turner, Perkins, & Bauerle, 2008), others have failed to encourage significant changes in alcohol consumption (e.g., Clapp, Lange, Russell, Shillington, & Voas, 2003; Granfield, 2005).

The social norms campaign by (Turner et al., 2008) successfully reduced the likelihood of first-year students having an estimated blood alcohol content higher than 0.08 (legal limit United States) the last time they partied and the likelihood of students experiencing negative consequences related to alcohol use. They did so by distributing messages that highlighted healthy normative behaviors on campus, as do most social norms campaigns. However, in addition to that students were provided with normative



information regarding protective behaviors (e.g., stopping friends from drinking and driving). Not only focusing on correcting misperceptions of drinking behavior, but in addition to that reducing misperceptions regarding helping behavior may provide a key to motivate change in alcohol consumption among college students. In Chapter 3 the influence of social norms on protective behaviors in alcohol consumption contexts is further studied.

The *Theory of Normative Social Behavior* (TNSB; Rimal & Real, 2005) proposes that the mixed findings in social norms interventions are on one hand due to a lack of a distinction between injunctive and descriptive norms (Cialdini et al., 1990) and on the other hand a failure to identify the underlying cognitive mechanisms of normative influence. The underlying idea of the TNSB is that individuals' perceptions about the prevalence of a behavior in their social environment (i.e., descriptive norm), by itself, is not be enough to instigate action. The TNSB proposes that certain moderators of the relationship between descriptive norms and intentions can aid the prediction of behavior change that results from descriptive norms. The TNSB posits that descriptive norms can motivate you to act if you also (a) perceive social pressures to conform (i.e., injunctive norm), (b) perceive similarity with the referent group (i.e., group identity), (c) believe that performing the specific behavior will result in benefits (i.e., outcome expectations); or (d) view the behavior as central to your self-concept (i.e., behavioral identity). In Chapter 2 the role of attitudes as a moderator of the descriptive norm - behavior relationship was tested.

## INJUNCTIVE VERSUS DESCRIPTIVE NORMS

Several studies have been undertaken into the adverse effects of norm messages on behavior (Cialdini et al., 2006; Sieverding, Decker, & Zimmermann, 2010; Stok, de Ridder, de Vet, & de Wit, 2012). A textbook example of how the communication of social norms can adversely affect behavior is that of Arizona State's Petrified Forest National Park. Several years ago, the park's executive board observed a serious problem, namely that the petrified wood for which the park is famous, was slowly disappearing from the park. Visitors were stealing the wood and, although none of the visitors stole large quantities, the total amount missing was substantial. In an effort to reduce this theft, the park board placed a sign at the park's entrance stating, "Your heritage is being vandalized every day by theft losses of petrified wood of 14 tons a year, mostly a small piece at a time." Unfortunately, the sign did not generate a

reduction in petrified wood theft. In fact, much like the above-mentioned health messages, the sign unintentionally created a positive descriptive norm towards the very behavior it was trying to prevent and may as posited have promoted further theft. Cialdini et al. (2006) were approached as experts and asked to help tackle this problem.

Within the framework of the *Focus Theory of Normative Conduct* (FTNC; Cialdini et al., 1990) a distinction is made between what most people do (i.e., descriptive norm) and what most others approve or disapprove of (i.e., injunctive norm). A second tenet within the FTNC is that norms (descriptive or injunctive) should motivate behavior predominantly when they are made salient, or are in focus. They therefore hypothesized that in situations where a majority acts in an undesirable way, the *focus* must shift from what other people do (i.e., descriptive norm) to what someone ought to do according to others (i.e., injunctive norm).

With this hypothesis in mind, the investigators placed, at three popular visitor sites within the park, different experimentally derived messages, one which like the original signs conveyed the normative nature of environmental theft: 'Many past visitors have removed the petrified wood from the park, changing the state of the Petrified Forest'. This sign also had a picture of three visitors taking wood. And another sign communicating an injunctive norm: 'Please don't remove the petrified wood from the park'. This sign had a picture of someone stealing a piece of wood with a red circle and bar over his hand thus indicating you ought not steal. In accordance with their hypothesis, Cialdini and colleagues (2006) found a significant difference between the two messages. As predicted theft was higher when the descriptive norm sign was displayed (7.92%), than when the injunctive norm sign was displayed (1.67%). Clearly, instead of calling attention to the theft problem and encouraging visitors not to steal, the message in which the theft prevalence was conveyed essentially gave people a sense of entitlement to engage in this undesired behavior: 'If others are taking a piece of petrified wood, than why wouldn't I?'

Evidently, these findings are particularly important when considering the impact of unintentional social norms communicated in health messages. They imply that in situations where the unhealthy behavior is prevalent, a descriptive norm message should be avoided to prevent causal reasoning such as: 'if others are eating unhealthy, than why wouldn't I?' An alternative approach is the communication of an injunctive norm. In cases where the majority acts in an unhealthy way, telling people what they ought to do rather than what other people are in fact doing might provide a better

strategy for changing behavior. This proposition is further investigated in Chapters 3 and 4.

Like descriptive norms, injunctive norms have been tied to multiple health behaviors, such as alcohol consumption (Cho, 2006; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007), marijuana use (Neighbors, Geisner, & Lee, 2008), cancer screening intentions, intentions to diet and eat fruits and vegetables (Smith-McLallen & Fishbein, 2008), intentions to exercise and to have a healthy diet (Yun & Silk, 2011). Like with descriptive norms, there is a difference between actual and perceived norms. Borsari and Carey (2003) found that the perceived approval of others' regarding alcohol consumption (i.e., injunctive norm) was overestimated to an even larger extent than descriptive norms. The process that is thought to underlie the overestimation of injunctive norms is pluralistic ignorance. What students in fact assume is that their own attitudes regarding alcohol consumption are more conservative than those of other students, while their outward conduct is the same (Prentice & Miller, 1993). An intervention to dispel overestimations of approval of drinking should therefore focus on reducing the perceived level of consensus in this respect (Prentice, 2008). In an intervention conducted by Schroeder and Prentice (1998), first year students participated in peer oriented discussion groups on alcohol consumption during their second week on campus. In these meetings, the discrepancy between the self and others in perceptions of comfort with drinking and how this would affect social life at campus were discussed. As expected a significant reduction in alcohol consumption was found at post-test four to six months later, relative to the control intervention.

Although both injunctive and descriptive norms have been found to affect health behavior, a distinction has to be made between descriptive and injunctive norms, as different processes underlie their influence on behavior. Injunctive norms are thought to be effective because they serve our goal of affiliation. We conform to injunctive norms, because we have a desire to build and maintain meaningful relationships with others. Through strategic action we aim to obtain social approval, and avoid disapproval and other social sanctions. Rather than being of simple informational value, injunctive norms are influential due to the promise of social sanctions (Cialdini & Goldstein, 2004; Cialdini et al., 1990; Deutsch & Gerard, 1955). The underlying idea here is: "if we do what others approve of they must approve of us too" and vice versa.

In line with the theoretical distinction between injunctive and descriptive norms it has been found that they can differentially affect behavior. While injunctive norms tend to remain effective over situations, descriptive norms are most effective within

the situation they were conveyed in (Reno, Cialdini, & Kallgren, 1993). This follows logically from the goals that are served by these norms. While the behavior of most others is a valid point of reference in one situation, it might not be in the next and does therefore not serve the goal of accuracy (Cialdini & Trost, 1998). In contrast to that, injunctive norms usually remain valid, because they tend to be broader and refer to what is approved or disapproved of conduct within a culture in general (Reno et al., 1993). In line with theorizing concerning the transsituational influence of injunctive norms Larimer, Turner, Mallett and Geisner (2004) found that descriptive norms were predictive of concurrent drinking, while injunctive norms were predictive of behavior one year later at follow-up.

Besides a proposed differential effectiveness over situations different self-regulatory processes have been found to underlie the influence of injunctive and descriptive norms. In two studies, Jacobson and colleagues (2011) investigated whether the distinctive qualities of descriptive and injunctive norms underlie different cognitive processes. It was found that descriptive norms, because they function as a shortcut in the decision-making process are more influential under conditions of low effortful cognitive activity. Injunctive norms on the other hand were found to require more effortful cognitive activity to be effective, because injunctive norms can result in a conflict between what one should do and what one actually would like to do (i.e., affiliative goals vs. personal goals). In Chapter 5 we investigate how message framing can tie into these processes to increase the effectiveness of injunctive and descriptive norms on motivation.

## **OVERVIEW OF THIS DISSERTATION**

There is substantial evidence suggesting that when unhealthy behavior is highly prevalent, descriptive norms should not be conveyed in health promotion campaigns. In such cases, injunctive norms might offer an alternative and promising approach to promote health behavior change. The main focus within this thesis is to test whether these assumptions indeed apply to different health behaviors (i.e., food consumption, exercise, protective behaviors in alcohol consumption contexts). Four experimental studies were conducted that tested the hypotheses regarding the adverse effects of descriptive norm messages, as well as injunctive norm messages as a potential alternative in health communication. In the fifth and final chapter the role of framing in increasing the effectiveness of injunctive and descriptive norm messages is examined.

In *Chapter 2* the findings of two behavioral laboratory studies are reported. The goal of these studies was to examine the possibly adverse effects of unhealthy descriptive norms on daily health behaviors, more specifically stair-use (Study 1) and food-choice (Study 2). To test the hypothesis that unhealthy descriptive norms would result in more unhealthy behavior, the relative influence of unhealthy descriptive norms on daily health behaviors was compared to healthy descriptive norms and a control group. In both studies immediate effects on actual health behavior served as an outcome measure. In the first study written messages were used to convey descriptive norms, while in the second study contextual cues were used to convey the prevalence of (un)healthy behaviors. In addition to that, in study two the role of attitudes as a moderator of the relationship between descriptive norms and behavior was examined.

*Chapter 3* describes a study in which the possibly adverse effect of unhealthy descriptive norm messages was examined in a naturalistic environment (Study 3). In addition to that the effectiveness of injunctive norm messages in increasing health behavior was studied. A field study was conducted among North American college students. Signs were posted at a university food court that either conveyed an unhealthy descriptive norm, or a healthy descriptive or injunctive norm. During a period of four weeks the different signs, corresponding to the three norms messages, were posted on different days of the week, alternated with a control group that received no signs. After food purchase, students reported their food choice through questionnaires provided to them.

*Chapter 4* reports on an online experiment into the positive and negative effects of descriptive norms on helping behaviors in alcohol consumption contexts (Study 4). Messages were conveyed that either described the high prevalence of helping behavior (e.g., asking a friend to slow down their drinking), or high prevalence of behaviors that emphasize autonomy in drinking situations (e.g., letting friends make their own drinking decisions). In addition to that the effects of positive and negative injunctive norms on helping behavior in alcohol consumption situations were assessed. Injunctive norms were conveyed through messages that either described the approval of others' related to helping behavior, or autonomy in drinking situations. The immediate effect of these messages on motivation to act pro-socially or pro-individually in drinking situations was tested, as well as actual behavior during the consecutive month. While descriptive as well as injunctive norms were expected to have the same immediate effects on motivation, it was expected that injunctive norms would be more influential at post-test, due to their transsituational influence (Reno et al., 1993).

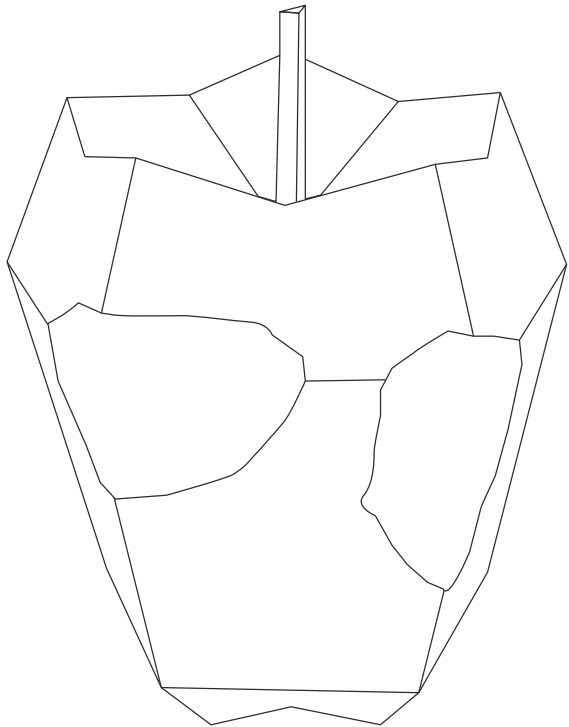
In the final empirical chapter (*Chapter 5*) the differential effects of framing on injunctive and descriptive norm messages were tested (Study 5). It was proposed that the persuasive effects of injunctive norms would be strengthened through a negative frame, while descriptive norms were expected to benefit from a positive frame. Participants read one of four normative messages about healthy and unhealthy food consumption that were all in favor of a healthy diet, or a control message pertaining to an unrelated topic. The positive injunctive and descriptive norm messages described strong approval or high prevalence of fruit consumption, respectively. While the negative injunctive and descriptive norm messages described the strong disapproval of candy consumption, or high prevalence of non-consumption of candy, respectively. After reading the message, motivation to make healthy versus unhealthy choices was assessed through an approach-avoidance task.

This thesis concludes with a general discussion in *Chapter 6*, providing suggestions for future research and implications for the use of social norms in health promotion practice.



## CHAPTER 2

### DECISION-MAKING IN UNHEALTHY SOCIAL ENVIRONMENTS: THE EFFECTS OF DESCRIPTIVE NORMS ON DAILY HEALTH BEHAVIORS



This chapter will be submitted for publication in a similar form as:

Mollen, S., Ruiter, R. A. C., Rimal, R. N., & Kok, G. Decision-making in unhealthy social environments: The effects of descriptive norms on daily health behaviors.



## **ABSTRACT**

The goal of the current study was to examine the possibly adverse effects of unhealthy descriptive norm messages, such as, “most people don’t eat enough fruit,” commonly used in health promotion. The relative influence of unhealthy descriptive norms on daily health behaviors was compared to healthy descriptive norms and a control group. Contrary to predictions, Experiment 1 (stair-use) and Experiment 2 (food-choice), showed that healthy and unhealthy descriptive norms result in more healthy behavior compared to a control group. Possible explanations such as reactance and central message processing were ruled out in Experiment 2. Also in Experiment 2, the moderating role of attitude was studied, but proved non-significant. It appears that in some cases people are able to resist unhealthy influences from their social environment. Understanding when and how this happens is critical, because it can provide the key to create positive changes in health behavior.

## INTRODUCTION

On a daily basis we have to make numerous seemingly simple decisions that can affect our health in the long term. Will we have a piece of apple pie, or do we sink our teeth into a shiny red apple, instead? Do we take the stairs to go up to the third floor or do we take the elevator? These are a just a few of the many daily lifestyle decisions we make that ultimately have an impact on our health. Healthy diet and physical activity are crucial in the prevention of a number of serious diseases and health problems, such as Type 2 diabetes, cardiovascular disease, as well as certain types of cancer (WHO, 2011).

To encourage healthy choices, health promotion professionals commonly communicate messages such as: “According to research, the average person in the UK eats less than 3 portions of fruit and vegetables a day instead of the recommended 5. This is even lower amongst young people.”(National Health Service [NHS], 2004); “The way we live nowadays means a lot of us, especially our kids, have fallen into unhelpful habits” (NHS, 2009); and, “Nine out of ten people eat less than the recommended two hundred grams of vegetables and two pieces of fruit a day” (Stichting Voedingscentrum Nederland, 2008). Even though these messages are well-intended and aim to promote healthy decisions, research in the field of social psychology indicates that these messages might be counter-productive (Cialdini, 2007; Mollen, Ruiter, & Kok, 2010). Findings show that the actions of others in our environment strongly influence our own decisions and actions (e.g., Burger & Shelton, 2011; Cialdini, Reno, & Kallgren, 1990; Keizer, Lindenberg, & Steg, 2008; Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008).

Descriptive norms are norms that describe the behavior of most others in our environment and are thought to influence our behavior because they provide information on the right way to act in a certain situation. When most others make a certain decision, this provides social proof on what is in fact the correct decision to make (Cialdini, 1984; Jacobson, Mortensen, & Cialdini, 2011). The rationale here is: “If others are doing it, it must be right”. The social influence that results from descriptive norms has been linked to different health behaviors, such as food consumption (Burger et al., 2010; Lally, Bartle, & Wardle, 2011; Smith-McLallen, & Fishbein, 2008; Yun & Silk, 2011), alcohol consumption (Neighbors, Lee, Lewis, Fossos, & Larimer, 2007; Rimal, 2008), physical activity (Burger & Shelton, 2011; Yun & Silk, 2011), and disease

detection behaviors such as cancer screening (Sieverding, Decker, & Zimmermann, 2010).

Research in the field of social norms shows that descriptive norms can have a positive effect on behavior - in cases where a majority acts in a positive way (e.g., Schultz, Khazian, & Zaleski, 2008). But descriptive norms can also have negative effects on behavior in cases where a majority displays undesirable behaviors (e.g., Burger et al., 2010; Cialdini et al., 2006; Sieverding et al., 2010). Therefore, the problem with communicating health messages that stress the high prevalence of unhealthy behaviors is that they might encourage unhealthy behavior. For those who have an unhealthy lifestyle, unhealthy descriptive norm messages will likely not increase motivation to change their unhealthy behavior, because “if others don’t use the stairs, why would I?” and for people who do have a healthy lifestyle, these unhealthy descriptive norm messages might have a boomerang-effect and cause people to behave less healthily (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). Consequently, descriptive norm messages that stress the high prevalence of unhealthy behaviors might have counterproductive effects and result in more unhealthy behavior (Mollen, Ruiter, & Kok, 2010).

The goal of the current study is to investigate the potentially adverse effects of unhealthy descriptive norm messages on everyday health behaviors, more specifically stair-use (Exp. 1) and fruit consumption (Exp. 2). For most people, either behavior can be easily incorporated into their daily routine and can thereby add to an overall healthier lifestyle. In the current research unhealthy descriptive norm messages, communicating that a majority has unhealthy habits, will be compared to healthy descriptive norm messages, communicating that most people make healthy decisions. Their relative influence on intentions and actual behavior will be examined.

## EXPERIMENT 1

### METHOD

#### *Participants and Design*

Participants were students at a Western European university that were randomly assigned to one of two (i.e., healthy, unhealthy) descriptive norm conditions or a control condition (in which no normative information was provided). After exclusion of five participants, for seeing through the cover-story, the final sample included a total of

84 participants ( $N_{\text{men}} = 24$ ;  $M_{\text{age}} = 21.11$ ,  $SD_{\text{age}} = 3.92$ ). Upon completion of the experiment, participants were paid, debriefed and thanked. The local ethics committee approved of the experimental procedure.

### *Procedure and Materials*

Participants were told that they were taking part in a physical and cognitive health survey; the tasks in the experiment were modeled in such a way that they aligned with the cover-story. Upon arrival at the laboratory, participants were guided to individual cubicles where they were seated behind a personal computer. The experiment was programmed in *Inquisit* (2009) and all instructions were provided through the program. To remain in line with the cover-story, participants started the experiment with several cognitive tasks, which concerned logical reasoning. After these tasks participants were given a second task, which contained the manipulation text. The text was presented as a memory task. Participants were told the text was from the university's newspaper. The *healthy descriptive norm* text stated that: "More than 75% of students at [name of university] uses the stairs to go up or down a couple of floors". And then continued by saying that elevators and escalators were not so popular anymore, that more and more people use the stairs and that this was also the case for students at [name of university]. The *unhealthy descriptive norm* message communicated the opposite and stated that: "More than 75% of the students at [name of university] use the elevator to go up or down a couple of floors". And continued by saying that elevators and escalators are popular, that less and less people use the stairs and that this was also the case for students at [name of university]. The *control* message was an unrelated text that pertained to the benefits of swearing when experiencing pain. As the information was presented as a memory task, participants were told that later on in the experiment they would have to answer a few questions about the text.

After participants read the text, they continued with the next task, which was a 'poster-task'. Participants were told that the posters were at another location (at the 5<sup>th</sup> floor) and were asked to go there to do the task and to return to the 2<sup>nd</sup> floor when they had finished the task. In the poster task there were three assignments that each corresponded to one of three posters. The first assignment was to describe the first poster that depicted a shadow of several camels in the desert in such a way that someone who could not see the poster was able to draw it based on their description. The second poster showed a futuristic looking glass building and participants were asked to describe four possible purposes for this building. The final task was to describe

two elements of the modern painting style (i.e., street art) that that was depicted in the third poster. After this, participants returned to their cubicle at the second floor and answered several questions, among others pertaining to their choice to take the stairs or elevator.

### *Measures*

*Descriptive norm perceptions* were measured with four questions, two pertaining to stair-use and two pertaining to elevator-use, “How often do you think students at [name of university] take the [stairs/ elevator] when going up or down a couple of floors?” (1= *never* – 6= *always*), and “What is the percentage of students at [name of university] that takes the [stairs/ elevator] when going up or down a couple of floors?” (0% - 100%; 10 % increments).

*Intention* to take the stairs was measured with two questions ( $r = .88$ ), “To what extent do you plan to take the stairs instead of the elevator (or escalator) more often in the future, when [going up/ going down] a couple of floors?” (1= *not at all* – 6= *very much*).

*Behavior* was measured by asking participants whether they took the elevator or the stairs to go up to do the poster task on the 5<sup>th</sup> floor.

## RESULTS

### *Norm perceptions*

A multivariate analysis of variance was conducted to examine the effects of the descriptive norm manipulation on norm perceptions of stair- and elevator use. The multivariate test of normative condition on descriptive norm perceptions showed a significant effect,  $F(8, 158) = 6.00$ ,  $p < .001$ ,  $\eta_p^2 = .23$  (univariate tests: all  $ps < .001$ ). The direction of effects was in line with expectations: the perceived percentage and frequency of stair-use was higher for those in the healthy descriptive norm condition, than in the unhealthy descriptive norm condition, while the opposite was true for elevator-use – the frequency and percentage of people taking the elevator was thought to be higher when the descriptive norm was unhealthy. Descriptive norm perceptions of those in the control condition mostly fell in between both conditions for both stair- and elevator-use (see Table 1).

TABLE 1

*Means and (SDs) of descriptive norm perceptions in the unhealthy and healthy descriptive norm condition and the control condition.*

	Descriptive norm condition		
	Unhealthy <i>n</i> = 29	Control <i>n</i> = 29	Healthy <i>n</i> = 26
Elevator-use			
Percentage	68.62 (14.07) <sup>a</sup>	56.55 (14.46) <sup>b</sup>	41.15 (21.42) <sup>c</sup>
Frequency	4.48 (.79) <sup>a</sup>	4.17 (.81) <sup>a</sup>	3.38 (.98) <sup>b</sup>
Stair-use			
Percentage	45.86 (20.62) <sup>a</sup>	43.45 (13.96) <sup>a</sup>	64.62 (17.26) <sup>b</sup>
Frequency	3.14 (1.03) <sup>a</sup>	3.28 (.88) <sup>a</sup>	4.19 (.85) <sup>b</sup>

*Note.* Means in rows with different subscripts differ at the  $p < .05$  level (Bonferroni correction).

### *Main analyses*

The effect of healthy and unhealthy descriptive norms on *intention* to use the stairs more frequently was tested with an ANCOVA, with gender as a covariate. Intentions however were not influenced by the descriptive norm messages,  $F < 1$ .

To analyze whether *behavior* was influenced by descriptive norm messages, a Chi Square analysis was done on stair-use,  $\chi^2 (2, N = 84) = 6.55, p < .05$ . Of those in the control condition, 62.07% used the stairs to go up three floors. In line with expectations this percentage was higher in the healthy descriptive norm condition (80.77%), the difference between both conditions however was not significant,  $p = .13$ . Counter to predictions, those who read the unhealthy descriptive norm message used the stairs significantly more often (89.66%), than those in the control condition,  $p = .01$ .

## DISCUSSION

When comparing this study to other recent studies that have investigated the effects of healthy and unhealthy descriptive norms on health behavior (Burger et al., 2010; Sieverding et al., 2010), we took a direct approach in manipulating descriptive norms by using written messages. So, a first explanation for the unexpected result - that unhealthy descriptive norms encouraged more healthy decisions - might be that the explicit nature of written messages produced reactance (Brehm, 1966). Explicit persuasive messages can backfire, because people feel that they are deprived of their freedom to make their own decisions. In this case reactance might have caused people

to become less convinced by the social proof provided in the normative messages. Subsequently, people might have become less convinced by a healthy descriptive norm message and take an opposite course of action in response to an unhealthy descriptive norm message. A second reason why people showed less conformity to the descriptive norm messages than expected might be that embedding the message within a memory task encouraged people to process the message centrally (Petty & Cacioppo, 1986). Conformity to descriptive norms originates in our goal to make accurate and efficient decisions (Jacobson et al., 2011), descriptive norms are therefore often referred to as shortcuts or heuristics in the decision making process (Cialdini, 1984). In line with the conceptualization of descriptive norms as heuristic cues is that they have been found to be especially effective under conditions of low cognitive capacity (Jacobson et al., 2011). Embedding the norm in a memory task might therefore have caused central processing of the message, which might have caused the unexpected effect of the unhealthy descriptive norm message, as well as a weaker effect of the healthy descriptive norm message.

## EXPERIMENT 2

To rule out the possibility that reactance or processing style were indeed responsible for the unexpected findings in Experiment 1, a follow-up study was conducted in which descriptive norms were manipulated through environmental cues. The use of environmental cues to manipulate descriptive norms is a common procedure and should minimize conscious awareness of normative influence (e.g., Burger et al., 2010; Cialdini, Reno, & Kallgren, 1990). Consequently, this should reduce possible reactance and central processing of the message. For this experiment an adaptation of prior procedures to manipulate descriptive norms was used (Burger et al., 2010; Cialdini et al., 1990). In addition to that, the role of attitudes as a moderator of the relationship between descriptive norms and health behavior was explored.

The Theory of Normative Social Behavior (TNSB; Rimal & Real, 2005) suggests that the relationship between descriptive norms and behavior is dependent upon a number of cognitive mechanisms or moderators. The moderators include injunctive norms (i.e., what others think one should do), outcome expectations, group identity, and behavioral involvement (Lapinski, Rimal, Devries, & Lee, 2007; Rimal, 2008; Rimal, Lapinski, Cook, & Real, 2005). More specifically the TNSB proposes that the influence of descriptive norms is stronger when people also perceive strong injunctive norms to

perform the behavior, have positive outcome expectations, feel connected with the norm group and if a person's own tie to the behavior is strong (Rimal & Lapinski, 2008). Other scholars have aligned with this idea and have for instance found involvement to be a moderator of the relationship between descriptive norms and intentions (Göckeritz et al., 2009).

In the current study, the role of attitudes as moderators in the relationship between descriptive norms and behavior was investigated. Attitudes can be defined as positive or negative evaluations of a certain behavior (Ajzen, 1991) and can be predictive of behavioral intentions (Sheeran, 2002) and behavior (Glasman & Albarracín, 2006). Attitudes however do not necessarily result in behavior; Acock and DeFleur (1972) therefore proposed the contingency-consistency hypothesis that the attitude-behavior relationship is moderated by social influence variables. They suggested that attitudes would be more predictive of behavior if their interaction with the social environment (e.g., social approval) would be taken into account. Since then, a number of studies have found support for the contingency-consistency hypothesis (Andrews & Kandel, 1979; Grube, Morgan, & McGree, 1986; Newcomb, Rabow, & Hernandez, 1992; Rabow, Neuman, & Hernandez, 1987), while others have not (Bagozzi & Schnedlitz, 1985; Conner & Mcmillan, 1999).

In the current study we examined whether attitudes were able to explain the unexpected effects of descriptive norms on behavior found in Experiment 1. The objective was to examine whether descriptive norms are more influential when they are in line with one's personal attitudes. Individuals in Western cultures tend to have a more individualistic mindset in which intrapersonal goals take precedence over interpersonal goals (Kim & Markus, 1999). It therefore follows that people do not automatically follow norms outlined by the group when these group norms are in direct conflict with their own personal attitudes towards that behavior. That is, perceiving many others engaging in unhealthy behavior (i.e., unhealthy descriptive norm) this is less likely to result in unhealthy behavior if the person has a negative attitude toward this unhealthy behavior. On the other hand, perceiving that many others engage in healthy behaviors (i.e., healthy descriptive norm) is likely to result in healthy behavior, if one also has positive attitudes toward this healthy behavior. These hypotheses were tested in Experiment 2.



## METHOD

### *Participants & Design*

Participants were randomly assigned to one of three conditions in a 1 x 3 (descriptive norm: healthy/ unhealthy/ no-norm) between-subjects design, with a pre-measurement. One hundred and fifteen students from a Western European university participated in this study in which we assessed the effects of healthy and unhealthy descriptive norms on food choice. For this they either received course credit or a gift coupon (€7,50). A total of 16 participants were excluded from the sample, three participants who recognized the true intent of the study and eight who were allergic to or really disliked the product that served as our behavioral measure, which renders social influence ineffective. Five others were removed because of a flaw in the experimental procedure. From the resulting sample of 99 participants, 49 were male ( $M_{\text{age}} = 21.18$ ,  $SD_{\text{age}} = 2.05$ ). After they completed the experiment, participants were paid, debriefed, and thanked. The local ethical committee approved of the experimental procedure.

### *Procedure*

The experiment consisted of two parts: a pre-measurement and an actual laboratory experiment where the influence of the descriptive norms on intentions, as well as actual behavior, were assessed. As part of the cover story, participants were told that they were taking part in a study about lifestyle and creativity. The pre-measurement was done online and contained self-report measures pertaining to healthy and unhealthy food. In addition, questions relating to other health behaviors (e.g., drinking, smoking) and creativity were added as filler items to mask the true intent of the study. After finishing the questionnaire, participants were invited to the laboratory by email to assess their creativity (on a different day). Upon arrival at the laboratory, participants were escorted to a cubicle by one of two experimenters (one male and one female) who was always a student experimenter of the opposite sex. In the cubicle the experimenter explained the procedure of the study to the participant.

The participant was asked to take a seat behind the desk, on which a computer, a USB stick and a transparent litter box were placed. The transparent litter box either contained: nearly empty fruit containers (transparent colored cups with one or two pieces of fruit in it; healthy descriptive norm), empty candy wrappers (unhealthy descriptive norm), or was completely empty (control condition). This was done to

convey that most participants before them had either made healthy or unhealthy choices. Participants were then informed that they would start with three 5-minute tasks that would measure their creativity. On the computer screen there was a timer that counted down from five minutes so that the participants would know when to start the next task.

This five-minute countdown for the creative tasks was also visible to the experimenters and served a specific purpose for the second part of the descriptive norm manipulation. During the third and fourth minute of the final creative task the other student experimenter walked into the cubicle; to rule out effects of (dis)similarity in the norm manipulation this was always someone of the same sex. While walking in, the experimenter indicated that he or she had forgotten a USB-stick that was placed on the desk at which the participant was sitting. In line with the experimental condition the experimenter was either eating a healthy snack (apple or melon from a colored transparent cup; descriptive healthy), an unhealthy snack (candy or chocolate; descriptive unhealthy), or nothing at all (control). After this short interruption, the participant had one or two more minutes to finish the final task. When the participant was finished with this last task the other experimenter - opposite sex - walked in carrying a tray with rewards on it to thank the participant for his or her effort. The participant could choose between fruit (i.e., apple or melon in a colored cup), or an unhealthy snack (i.e., chocolate or candy). After they made their choice, the experimenter started the online questionnaire and participants were asked to fill this out. This questionnaire was identical to the pre-measurement questionnaire. When they finished the online questionnaire participants were asked to fill in a final form that asked them what study they did, the year of their study they were in, what their native language was, whether they were allergic to one of the foods that was offered to them and what they thought the goal of the study was.

### *Measures*

The online questionnaire consisted of measures related to fruit and sweet- or salty snack (such as, candy, cookies, chocolate, crisps, etc.) consumption.

*Attitude* was measured with five questions per category: "I think eating [fruit/ sweet or salty snacks (such as candy, cookies, chocolate, crisps, etc.)] is" (1=*useless*- 7=*useful*; 1= *unpleasant*- 7= *pleasant*; 1= *bad*- 7= *good*; 1= *worthless*- 7= *valuable*; 1= *nasty*- 7= *enjoyable*) ( $\alpha_{\text{pre-fruit}} = .88$ ;  $\alpha_{\text{post-fruit}} = .84$ /  $\alpha_{\text{pre-snacks}} = .72$ ;  $\alpha_{\text{post-snacks}} = .76$ )

*Intentions* were measured with one question, per category: “To what extent do you intend to eat [more fruit/ less sweet or salty snacks (such as, candy, cookies, chocolate, crisps, etc.)] in the future? (1= *definitely not*- 7= *certainly*).

*Behavior* was the choice of a healthy fruit snack (i.e., apple or melon), or an unhealthy candy snack (i.e., chocolate, gummy bears), this was obtained through observation.

#### *Pre-test descriptive norm manipulation*

To investigate whether the proposed manipulation of healthy and unhealthy descriptive norms would have the desired effect on participants, a pre-test was conducted. Participants were randomly assigned to receive the experimental scenario of the healthy or unhealthy descriptive norm manipulation. This experimental scenario - from the participants’ point of view - was accompanied by two pictures of the experimental setup, the first picture provided an overview of the desk the participants sat at, with the computer, USB-stick and the transparent litter-box and the second picture provided a close-up of the litter-box with the packaging of the healthy or unhealthy foods inside. Subsequently participants were asked what they thought the choice of previous participants in the experiment had been, there were four options, 1) I don’t know, 2) Fruit 3) Candy/ Chocolate, or 4) Other.

A total of 75 students from the same Western European university participated in this pre-test. A total of five participants reported to have no idea what participants chose and two marked the ‘other’ category; they were therefore removed from the analysis. The final sample consisted of 68 participants (17 men;  $M_{\text{age}} = 21.49$ ;  $SD_{\text{age}} = 2.63$ ). A Chi Square analysis was conducted to see if the two experimental groups indeed differed in their normative perception. As expected this was the case,  $\chi^2(1, N = 68) = 33.64, p < .001$ . Of the participants who read the unhealthy descriptive norm scenario 94.87% thought “participants before them” had chosen candy, and those who read the healthy descriptive norm scenario mostly thought others “before them” had chosen fruit (72.41%). This indicates that the procedure as used was successful in priming healthy and unhealthy descriptive norms.

#### *Statistical analyses*

To examine the effects of descriptive norms (i.e., healthy, unhealthy) on intentions, and attitude (toward fruit or unhealthy snacks) as a possible moderator in this, two univariate analyses of covariance were done while controlling for intention at pre-

measurement (i.e., to eat more fruit, or less candy). Following guidelines from Aiken and West (1990) on testing interaction-effects with continuous measures, scores on attitude toward fruit and snacks were first centered on their means and subsequently entered as a moderator. If the dependent variable concerned fruit consumption, the attitude concerning fruit consumption was entered into the analysis as a moderator; when the outcome variable concerned snack consumption the attitude concerning snack consumption was entered into the analyses.

With regard to actual behavior two hierarchical logistic regression analyses were done, one to examine the moderating role of attitudes toward fruit consumption and one to examine the moderating role of attitudes towards snack consumption. In the first step, condition was entered into the model, and in the second step the main effect of attitudes and its interaction with condition.

## RESULTS

### *Manipulation check*

Participants were observed by the experimenters on a monitor to assess whether they noticed the litter box, and whether they noticed that the experimenter was eating when entering their cubicle. This was done by observing whether participants, at any time during the creative tasks, turned their head toward the litter box, and turned their head towards the experimenter when he or she walked into the cubicle. Observations indicated that 97.06% of those in the descriptive norm conditions noticed the litter box and 89.71% noticed the experimenter eating. All but one participant saw at least one of the two descriptive norm manipulations. Removing this one participant from the analyses did not change the results and the participant was therefore retained.

### *Main analyses*

*Intentions* to eat more *fruit* were not influenced by the descriptive norm,  $F < 1$  and no interaction between descriptive norms and attitudes toward fruit consumption was found,  $F(2, 92) = 1.83$ ,  $p = .17$ ,  $\eta_p^2 = .04$ . Intentions to eat less *unhealthy snacks* were also not influenced by the descriptive norm,  $F(2, 92) = 1.15$ ,  $p = .32$ ,  $\eta_p^2 = .02$  and the interaction between attitude toward unhealthy snacks and condition was non-significant,  $F(2, 92) = 1.94$ ,  $p = .15$ ,  $\eta_p^2 = .04$ . No effects of descriptive norms on intentions were obtained, nor was there any indication that attitude moderates the relationship between descriptive norms and behavior.

*Behavior* was found to be influenced significantly by descriptive norms,  $p = .02$ . The odds to choose fruit over candy were higher in the healthy descriptive norm condition than in the control condition,  $\theta (.51) = 0.99$ ,  $p = .05$ ,  $OR = 2.68$  [ $CI = .99 - 7.26$ ]. The same was found when comparing the unhealthy descriptive norm condition to the control condition,  $\theta (.54) = 1.44$ ,  $p < .01$ ,  $OR = 4.22$  [ $CI = 1.47 - 12.10$ ]. The odds to choose a healthy snack were significantly higher in the unhealthy descriptive norm condition, than in the control condition. There was no main effect of attitudes,  $p = .49$ , nor was the effect of descriptive norms on food choice moderated by attitudes toward fruit,  $p = .85$ . It was also not moderated by attitudes toward snacks,  $p = .90$ , and again there was no main effect of attitude toward eating snacks,  $p = .59$ . This indicates that contrary to our hypotheses, but in line with the previous study, both the healthy and the unhealthy descriptive norm resulted in more healthy choices, compared to a control condition, but that attitude did not play a moderating role in this.

## DISCUSSION

To rule out that reactance to the descriptive norm messages or central processing thereof caused the unexpected results in Experiment 1, we conducted Experiment 2 in which descriptive norms were manipulated by means of contextual cues. In Experiment 2 the same results were obtained as in Experiment 1 that show that both a healthy and an unhealthy descriptive norm can result in more healthy choices. The second hypothesis that the effects of descriptive norms on behavior would be moderated by attitudes could not be confirmed as no significant interaction effects were obtained.

## GENERAL DISCUSSION

The current investigation of normative influence on health behaviors shows that both healthy and unhealthy descriptive norms can produce an increase in healthy behaviors (i.e., stair-use and food choice), compared to a control condition. This is in contrast with prior reports in the field of social norms that show that descriptive norms can have a desirable, as well as undesirable influence on health behavior (e.g., Burger et al., 2010; Sieverding et al., 2010), but also other behaviors (e.g., Cialdini et al., 2006; Schultz et al., 2007), depending on the direction of the norm.

In Experiment 1 explicit descriptive norm messages embedded in a memory task were used to influence stair-use (vs. elevator-use), it was found that an unhealthy

descriptive norm message resulted in significantly more stair-use, compared to a control condition. Two possible explanations were proposed, the first one being reactance, caused by the explicit nature of the message (Brehm, 1966) and the second one central processing of the message due to its embedment in a memory task (Petty & Cacioppo, 1986). To rule out these explanations, in Experiment 2, the experimental procedure was adapted and descriptive norms were manipulated by means of contextual cues, thereby reducing possible reactance and central processing of normative information. Contrary to expectations, however, the same unexpected effect was obtained in the second experiment, as it was found that both healthy and unhealthy descriptive norms about food-choice resulted in healthier decisions. In addition to that the moderating role of attitudes in the descriptive norm-behavior relation was tested in Experiment 2. However, no evidence for attitude as a moderator was found.

#### *Self-regulation in a social environment*

It appears that in some cases people are able to resist unhealthy influences from their social environment. Research on self-regulation provides insight into how healthy decisions are made in situations where one is confronted with temptations. Successful self-regulation means that behavior is brought in line with one's ideals or goals (Baumeister & Vohs, 2007) and is not always the product of conscious efforts, but can also occur automatically (Fishbach, Friedman, & Kruglanski, 2003). Automatic self-regulation for instance happens when one has the intention to lose weight. Frequent attempts at self-control when one is confronted with temptations (e.g., to eat chocolate) can then result in facilitative and inhibitory links between tempting items (e.g., chocolate) and long-term goals one has to maintain a healthy diet. Through time these links can become overlearned and work to guide healthy choices automatically. This means that among successful dieters the goal to eat healthy becomes automatically activated upon confrontation with unhealthy (but tasty) food. Evidence for an automatic link between temptations and goals to live healthy was indeed found by Fishbach, Friedman and Kruglanski (2003).

Not conflicting attitudes, but goals might therefore lie at the core of the findings in the current studies. Unhealthy social norms could be construed as temptations within a social environment. Confrontation with an unhealthy descriptive norm (i.e., most others take the elevator, or eat candy) might have automatically activated long-term health-goals in people, which subsequently motivated them to make a healthy

decision. This might provide a fruitful avenue for further study, as understanding what makes a person act healthy in an unhealthy social environment is critical, because it can provide the key to accelerate positive change in the midst of a negative trend of increasing overweight and obesity rates (WHO, 2011).

Another explanation pertains to the focus theory of normative conduct (Cialdini et al. 1990), which asserts that behaviors are influenced by norms that are made salient at the time of action. In our study, the negative descriptive norms (that others are taking the elevator in Experiment 1 and that others are eating candy in Experiment 2) may have primed – or made salient – the desirable behaviors. In other words, when one is made to think about (or witnesses) the negative behaviors that others engage in, then the negativity of that behavior becomes salient in one’s mind, and thus people revert to the healthier option.

### *Conclusion*

The current studies show that unhealthy descriptive norms do not necessarily result in more unhealthy behavior. This does not mean, however, that communicating messages that describe the high prevalence of unhealthy behaviors, such as “Nine out of ten people eat less than the recommended two hundred grams of vegetables and two pieces of fruit a day” reflects good health promotion practice, as the boundary conditions under which these messages have a positive or negative effect on health behavior are still unknown. Future research should explore the factors that make a person act healthy in an unhealthy social environment to be able to encourage positive changes in health behavior by means of interventions.

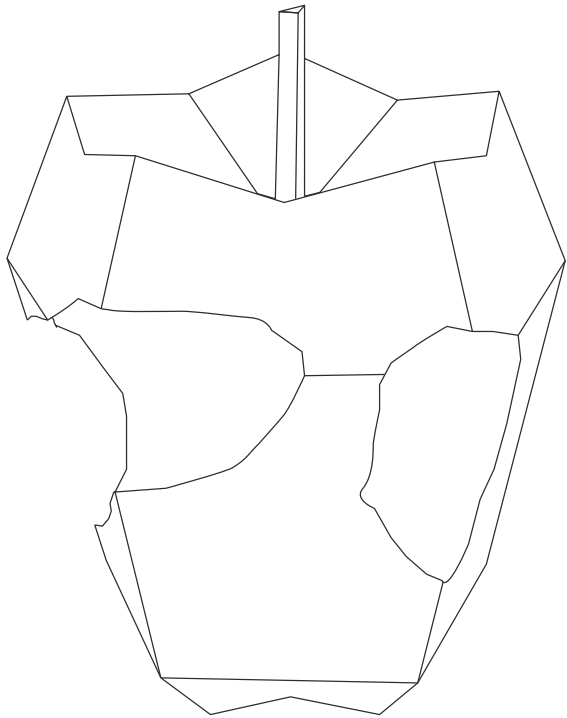






## CHAPTER 3

### HEALTHY AND UNHEALTHY SOCIAL NORMS AND FOOD SELECTION: FINDINGS FROM A FIELD-EXPERIMENT



This chapter has been submitted for publication in a similar form as:

Mollen, S., Rimal, R. N., Ruiter, R. A. C., & Kok, G., Healthy and unhealthy social norms and food selection: Findings from a field-experiment (Revision).

**ABSTRACT**

The goal of the current study was to examine the possibly adverse effects of unhealthy descriptive norm messages commonly used in health promotion and compare the relative effectiveness of unhealthy descriptive norms with healthy descriptive and injunctive norms on food choice in a naturalistic environment. Three signs, corresponding to the three norms messages, were posted on different days of the week alternated with a control condition that received no signs, during a period of four weeks in an on-campus food court. A total of 687 students reported their food choice through a questionnaire provided to them. Food choices were analyzed for the group of students who indicated to have seen the norms sign (and those in the control condition;  $N = 231$ ). The hypothesis that an unhealthy descriptive norm would result in less beneficial food choices was partially confirmed; while it did not result in more unhealthy choices, it did result in less healthy choices. The hypothesis that both healthy norms (descriptive and injunctive) would result in healthier food choices was supported. Results indicate that the well-intended use of unhealthy descriptive norms in health promotion should be avoided and that, when possible, healthy descriptive or injunctive norms should be communicated to encourage healthy diets.

## INTRODUCTION

Globally, more than one billion adults are overweight, and a little under one third of them are obese, with a BMI higher than 30 (World Health Organization [WHO], 2003). The chance of incurring health risks such as Type 2 diabetes and hypertension grows with increasing overweight, and behavior change is a critical factor in reversing the growing trend in obesity (WHO, 2003). Some key behaviors in this regard include increasing fruit and vegetable intake, reducing the consumption of fatty foods, and replacing saturated animal-based fats with unsaturated vegetable oil-based fats (WHO, 2003). A change in dietary behavior can therefore be made by something as simple as occasionally replacing a hamburger with a salad. In this paper, we explore whether social norms-based messages can induce people to make healthy dietary choices and whether highlighting the prevalence of an unhealthy behavior can be counterproductive.

Using norms-based appeals to promote healthy behaviors is an increasingly popular strategy. Typical examples from messages used by health promotion organizations to encourage behavior change are: "According to research, the average person in the UK eats less than 3 portions of fruit and vegetables a day instead of the recommended 5. This is even lower amongst young people." (National Health Service [NHS], 2004); and, "Nine out of ten people eat less than the recommended two hundred grams of vegetables and two pieces of fruit a day" (Stichting Voedingscentrum Nederland, 2008). Even though these messages are well-intended and aimed at increasing healthy diets, they might be counterproductive (Cialdini, 2007; Mollen, Ruiter, & Kok, 2010), because research shows that the behavior of others in our environment (i.e., descriptive norms) strongly influences our own choices and actions (e.g., Burger & Shelton, 2011; Cialdini, Reno, & Kallgren, 1990; Keizer, Lindenberg, & Steg, 2008; Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008).

Descriptive norms are thought to influence behavior because they provide information on the right way to act in a certain situation and thereby serve our goal of accuracy (Cialdini & Goldstein, 2004). When most others make a certain decision, this provides social proof on what is in fact the correct decision (Cialdini, 1984; Jacobson, Mortensen, & Cialdini, 2011). This means that descriptive norms are especially effective in situations that are ambiguous, or when one is uncertain of what kind of decision to make (Deutsch & Gerard, 1955; Griskevicius, Goldstein, Mortensen, Cialdini, & Kenrick,

2006; Tesser, Campbell, & Mickler, 1983). In this sense descriptive norms can function as heuristic cues in the decision-making process (Cialdini, 1984; Jacobson et al., 2011).

Relevant in light of the current issue with overweight and obesity is that the behavior of others has been found to play a significant role in people's food intake (Herman, Roth, & Polivy, 2003; Hermans, Engels, Larsen, & Herman, 2009). Descriptive norms have been found to influence the extent to which people intend to pursue healthy diets (Lally, Bartle, & Wardle, 2011; Smith-McLallen & Fishbein, 2008; Yun & Silk, 2011). In addition, evidence indicates that descriptive norms influence actual healthy or unhealthy food choices (Burger et al., 2010). Burger and colleagues (2010) found that participants who were made to believe that others before them had made healthy choices also tended to make healthy choices themselves. However, when participants were made to believe that others before them had made unhealthy choices, they also made more unhealthy choices. This means that, while healthy descriptive norms can have a positive influence on health behavior, the opposite can also occur. Consequently, the problem with health promotion messages that stress the high prevalence of unhealthy diets is that they might further increase unhealthy behavior. For those who have an unhealthy diet, these messages will likely not increase motivation to change, because people may look to others' behaviors to justify their own; among those who already maintain a healthy diet, these unhealthy descriptive norm messages might have a boomerang-effect and cause people to behave less healthily (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). Accordingly, descriptive norm messages that stress the high prevalence of unhealthy diets might have counterproductive effects and result in more unhealthy behavior.

The goal of the current study is to extend these findings by investigating the possibly adverse effects of unhealthy descriptive norm messages on actual food choice within a naturalistic setting, and compare this to the expected positive effects of a healthy descriptive norm message. Studying the effects of healthy and unhealthy norms in a field setting increases external validity of findings, even though, compared to controlled laboratory-based studies, internal reliability may be somewhat compromised (Cook & Campbell, 1979).

If, objectively, a greater number of people engage in an unhealthy than in a healthy behavior, highlighting a positive descriptive norm surrounding that behavior cannot be done truthfully (or with much credibility). In these cases, it might be beneficial to communicate an injunctive norm, or what others think one should do (Cialdini et al., 1990; Mollen et al., 2010). Injunctive norms describe the conduct of which most others

approve or disapprove, and they are thought to be effective because they serve an affiliation goal. Through strategic action, such as conforming to injunctive norms, people aim to obtain social approval, and avoid disapproval and other negative social sanctions. The rationale behind this thinking is that, if we do things that others approve of, others will approve of us, too (Cialdini & Goldstein, 2004; Cialdini et al., 1990; Deutsch & Gerard, 1955; Jacobson et al., 2011). Both injunctive and descriptive norms have been found to predict intentions to pursue a healthy diet (Smith-McLallen & Fishbein, 2008; Yun & Silk, 2011). Because injunctive and descriptive norms serve different goals, they also tend to have a differential effect on behavior. Descriptive norms are most effective under conditions of low cognitive activity, whereas the opposite is true for injunctive norms (Jacobson et al., 2011). However, a study comparing the effects of descriptive and injunctive norm messages in the field of environmental behavior showed that both a positive descriptive and a positive injunctive norm message resulted in the same reduction in environmentally unfriendly behavior, compared to a negative descriptive norm that stressed the high prevalence of undesirable behavior (Cialdini et al., 2006). This means that, even though descriptive and injunctive norms influence behavior in different ways, their effects on behavior are comparable and therefore both norms are suitable to use as a behavior change tool. In this case, the advantage of using an injunctive norm would be that one can advocate for a positive conduct (“you should eat enough fruits and vegetables”); when the prevailing descriptive norm among the target group is unhealthy (e.g., if most people make unhealthy decisions), highlighting the descriptive norm would be ill-advised.

### *Current study*

In the current study, the effects of normative messages (i.e., healthy descriptive, healthy injunctive, and unhealthy descriptive) on food choice were tested in a naturalistic environment. In line with previous studies that have investigated the negative effects of messages describing the high prevalence of undesirable behaviors (Burger et al., 2010; Cialdini et al., 2006), or low prevalence of desirable behaviors (Lapinski, Rimal, DeVries, & Lee, 2007; Sieverding, Decker, & Zimmermann, 2010), the expectation is that an unhealthy descriptive norm message, communicating the high prevalence of unhealthy food choices, has a counterproductive effect. More specifically, the prediction is that an unhealthy descriptive norm message will result in more unhealthy food-choices, compared to both baseline (i.e., no-sign control condition), and the healthy social norm messages (both descriptive and injunctive). For

both healthy norm signs (i.e., descriptive and injunctive), it was predicted that they would result in more healthy food choices, compared to baseline, as well as in comparison to the unhealthy descriptive norm message.

### *Norm focus*

Written messages were used to induce injunctive and descriptive norms. In interventions there are two ways in which beliefs - in this case normative beliefs - can be used in messages to influence behavior. The first is to change beliefs and the second is through priming or making salient, already existing beliefs (Fishbein & Cappella, 2006). With priming strategies one can increase the accessibility of specific beliefs to increase their effect on subsequent actions. This aligns with one of the premises of the *Focus Theory of Normative Conduct* that social norms should primarily be predictive of behavior when they are made salient or are otherwise focused on by an individual (Cialdini et al., 1990). A social norm message may therefore influence motivation or behavior either through changing normative perceptions, or by focusing individuals on the norm. It is expected that due to the differential nature of injunctive and descriptive norms a norm message will differentially influence their respective norm perceptions.

With regard to descriptive norms, what is done by most others in one situation may differ from another situation. While the behavior of most others is a valid point of reference in one situation, it might not be in the next and therefore does not serve its underlying goal, the goal of accuracy (Cialdini & Trost, 1998). Perceptions of descriptive norms may therefore rather easily change, as it is adaptive to adjust your perceptions to the norm of conduct in that particular situation. Injunctive norms however, are relatively universal cultural standards of conduct, whose influence transcends situations (Reno, Cialdini, & Kallgren, 1993). An injunctive norm message will therefore more likely prime or make salient already existing beliefs about the acceptability of a certain behavior. In this case approval regarding healthy food consumption can be said to be an existing universal cultural belief. For descriptive norm messages it is expected that they will influence behavior through changing descriptive normative beliefs, while injunctive norm perceptions will likely not change as a result of an injunctive norm message, but will merely make salient already existing beliefs.

## METHOD

### *Field Setting*

The setting for this study was an on-campus food court, open on weekdays during lunch hours (11AM - 2PM). In order to study the effects of healthy social norms (i.e., descriptive, injunctive) and unhealthy descriptive norms within a single setting, the healthy and unhealthy descriptive norm message described the high prevalence of either a healthy or an unhealthy food choice, respectively. In the food court, a variety of food options that varied in healthfulness were offered. Choices included salads (served in the tossed salad area) and hamburgers (served in the grill area). These two establishments were placed across from each other in the food court and offered lunch at about the same price. This made salads (as a healthy food option) and hamburgers (as an unhealthy food option) ideal for studying the effects of healthy and unhealthy descriptive norms on students' food choice. Taking this approach allowed the study to be administered in one location, keeping all other circumstances as constant as possible, thereby reducing the impact of confounding variables.

### *Participants*

A total of 729 people who visited the food court at the campus of an Eastern private university in the United States agreed to participate in this field study. To promote homogeneity in the sample and because the descriptive normative messages pertained to behaviors of students, only regular students at the university were retained. Therefore, forty-two participants were excluded from the study, because they were not students, but were, instead, staff members or visiting students. In the final sample of 687 students (336 men, 347 women), 78.2% were born and raised in North America, 11.5% in Asia, 4.2% in Europe, 1.7% in Latin America, 1.5% in the Middle East, 0.7% in Africa, and 0.4% in Australia; 1.6% marked the *other* category. Age of participants ranged from 17 to 34 years old ( $M = 20.85$ ,  $SD = 2.52$ ). The procedure and materials were approved by the university's institutional review board. Upon completion of the field-experiment, the responsible researcher set up a stall in the food court for debriefing. People who came to the stall were debriefed and offered a choice of fruit or candy to thank them for their participation.



### *Procedure and Materials*

The on-campus food court consisted of several separate food stations: a salad bar (e.g., tossed salads), pizzeria (e.g., pizzas, side salads), deli (e.g., sandwiches), “grab and go” (e.g., sandwiches, salads, sushi, soup), and a grill area (e.g., hamburgers, chicken tenders, fries). For the purpose of the study, only the salad bar and grill area were part of the experiment. Three social norm messages about hamburger and salad consumption were constructed, all of which started with the same header: “What are you having today?” This question was followed by the descriptive (healthy/ unhealthy) or injunctive norm message. Thus, the four conditions were: healthy descriptive norms, healthy injunctive norms, unhealthy descriptive norms, and no-message control. The social norm messages either pertained to the consumption of burgers or tossed salads.

In order to base the descriptive norm messages on actual behavior, prior to the field study, the number of burgers and salads sold were counted on two consecutive days. Based on these counts, the following descriptive norm messages were constructed: the *unhealthy descriptive norm message* read “Every day more than 150 [name of university] students have a burger for lunch here,” which was accompanied by the university’s logo and two photos of the grill area. The *healthy descriptive norm message* read “Every day more than 150 [name of university] students have a tossed salad for lunch here”; this message was accompanied by photos of the salad bar and the university logo. The *injunctive norm message* also pertained to tossed salads, and read “Have a tossed salad for lunch!” which is similar to the wording used for a positive injunctive norm in previous research by Cialdini and colleagues (2006) and indicates that having a salad for lunch is approved of by others. This poster also depicted the salad bar and the university’s logo. In the control condition no signs were posted.

Each day a different norm message was posted during opening hours, and this was done for four consecutive weeks. The norms message was conveyed by means of four different signs posted at different locations in the food court. Two large signs of 24” x 36” were posted on an easel at both main entrances, and two small signs (11” x 17”) were placed at the entrance to the grill and salad area. The order in which the signs were posted was counterbalanced to make sure each sign would be displayed each day of the week (Monday through Friday).

According to a pre-determined procedure, during this daily period of three hours, the experimenter aimed to hand out 40 questionnaires. She asked for participation in the study only from those who appeared to be within the age range of typical undergraduate students (between 18 and 22 years old) and those who were eating

food purchased in the cafeteria. Thus, excluded from the study were individuals who appeared to fall outside the age range and those who were consuming foods brought from the outside<sup>1</sup>. A final consideration was the size of the group in which potential participants were eating. Those eating alone or in small groups were asked to participate; this was done to ensure that participants did not have too many distractions. We excluded individuals who had previously participated in the study (on prior days). When participants agreed to take part by filling in the questionnaire, they were thanked by the experimenter and given a questionnaire and pencil and were instructed to drop the questionnaire in the drop-box upon exiting the food court.

### *Measures*

*Demographic variables*, such as gender, age, student classification and country of origin were assessed. *Food choice habits* were assessed by asking participants which of the establishments in the food court they visited most often (i.e., salad bar, pizzeria, deli, grab and go, meals in a minute, grill area, or other), which food item they ordered most often at this establishment (open-ended), and how healthy they perceived this choice to be (1 = *not at all healthy* - 7 = *very healthy*). The same questions were asked but rephrased for current food choice.

Food choice (open-ended) was recoded into two variables, one that reflected salad choice and another that reflected burger choice. Salad consumption was coded as “salad” only if the stipulated salad contained greens. Therefore, a hummus or chicken salad was not counted as a salad. Because salads were supposed to reflect a healthy choice, a combination of a salad with other food items such as a sandwich or pizza was not counted as a salad. A food choice was counted as a hamburger if it was referred to as a hamburger (or “burger”); this included vegetarian burgers, turkey burgers and chicken burgers, in addition to regular hamburgers. Other products bought in the grill area did not count as a burger, examples of which were chicken tenders, grilled cheese sandwiches and mozzarella sticks. The first author coded food choices according to the coding scheme and this was checked for accuracy by one of the coauthors; two flaws in the coding were uncovered and subsequently corrected.

---

<sup>1</sup> Decisions to hand out questionnaires were never based on the type of food bought. Objective food choice counts indicate that random selection of participants was indeed successful (see discussion).

*Norm perception* questions were asked to measure whether the social norm signs changed perceptions of social norms pertaining to both descriptive and injunctive norms. First, more generally, participants were asked whether they remembered seeing a sign upon entering the food court, and if so, whether they could reproduce the text on the sign. In addition, two questions were asked for descriptive norm perceptions. Students were asked to estimate how many students visiting the on-campus food court they thought ordered a tossed salad per day, and a hamburger per day. The injunctive norm was assessed by asking participants to rate, on a 7-point scale, the extent to which they disagreed or agreed with two injunctive norm statements, “most people think it is appropriate for me to order a 1) tossed salad, and 2) hamburger for lunch” (1= *strongly disagree* - 7 = *strongly agree*).

## RESULTS

### *Norm manipulation and perceptions*

Out of a total of 687 students, 140 were in the control and 547 in the experimental conditions. Among those in the control condition, 119 (85%) correctly recalled not having seen a poster upon entering the cafeteria. A little over one fifth of those in the experimental conditions (21.9%;  $n = 120$ ) indicated seeing a poster upon entering the food court. Those who incorrectly recalled the message in the experimental conditions, as well as those who mistakenly reported seeing a sign in the control condition were removed from the analyses; this resulted in a final sample of 231 participants, corresponding to  $n = 119$ ,  $n = 33$ ,  $n = 42$ , and  $n = 37$ , in the control condition, healthy descriptive norm, healthy injunctive norm, and unhealthy descriptive norm condition, respectively. Those who were not exposed were excluded because the interest was on understanding the effects of, not factors that enhance, exposure. Analyses after this point therefore only concern this subsample<sup>1</sup>.

To check whether people indeed perceived hamburgers to be an unhealthy food item and salads a healthy food item, ratings of healthiness of food choice were compared by means of a univariate analysis of variance. Those who had a burger for lunch indeed rated their food choice as less healthy ( $M = 3.00$ ;  $SD = 1.22$ ), than those

---

<sup>1</sup> Analyses on the complete sample (intention to treat analysis) did not yield any significant differences between groups.

who chose to have something else for lunch ( $M = 4.10$ ;  $SD = 1.58$ ),  $F(1, 219) = 20.78$ ,  $p < .001$ ,  $\eta_p^2 = .09$ . The same analysis was done to confirm that salads were regarded as a healthy lunch choice. In line with expectations, salads were perceived to be a healthier food option than other food choices ( $M_{salad} = 5.71$ ;  $SD_{salad} = 1.03$  vs.  $M_{other} = 3.39$ ;  $SD_{other} = 1.33$ ),  $F(1, 219) = 113.30$ ,  $p < .001$ ,  $\eta_p^2 = .34$ .

To test whether *injunctive norm perceptions* were affected by the injunctive norm sign, pairwise comparisons of the injunctive norm group with the control group were conducted. The  $F$ -tests showed no significant differences between the control and injunctive norm condition in perceived approval of ordering a salad for lunch,  $F < 1$ , nor for the perceived approval of ordering a hamburger for lunch,  $F(1, 158) = 2.52$ ,  $p = .11$ ,  $\eta_p^2 = .02$ . This confirms the expectation that injunctive norms do not change as a result of an injunctive norm message.

*Descriptive norms perceptions* varied quite a bit between people, with estimates as high as 600 sold salads and 1000 sold burgers a day. Therefore means and standard deviations were calculated and outliers ( $\geq 3SD$ ) were removed<sup>1</sup>. This meant that salad sales perceptions equal to or higher than 400 and burger sales perceptions equal to and higher than 600 were removed. Following that, scores were transformed to reflect the absolute deviation from the norm as communicated by the poster. As predicted, the mean deviation from the norm was lower in the healthy descriptive norm condition ( $M = 50.32$ ;  $SD = 40.78$ ), than in the control condition ( $M = 82.25$ ;  $SD = 42.85$ ),  $F(1, 137) = 13.66$ ,  $p < .001$ ,  $\eta_p^2 = .09$ . The same procedure was followed for burger sales perceptions, and again the deviation from the norm was lower in the unhealthy descriptive norm condition ( $M = 42.97$ ;  $SD = 57.72$ ) than in the control condition ( $M = 90.25$ ;  $SD = 73.08$ ), than,  $F(1, 134) = 11.76$ ,  $p < .005$ ,  $\eta_p^2 = .08$ . Findings align with the expectation that descriptive norm perceptions change as a result of descriptive norm messages.

### Main analyses

To test the hypothesis that *hamburger consumption* would be highest in the unhealthy descriptive norm condition, a hierarchical logistic regression analysis was done in which the unhealthy descriptive norm group was compared to the other three

---

<sup>1</sup> Before calculating means and standard deviations one highly extreme score was removed, to minimize skewness.

groups. The main analyses on food choice included 220 cases, because there were 11 missing cases. Gender and habit were entered in the first step of the regression. The difference between men and women in the likelihood to eat hamburgers did not reach a level of significance,  $\beta$  (.39) = -.64,  $p < .10$ , OR = 0.53 [CI = 0.25 - 1.12], the habit to eat hamburgers was, however, found to be a strong predictor of hamburger choice,  $\beta$  (.39) = 2.62,  $p < .001$ , OR = 13.72 [CI = 6.37 - 29.52]. In the second step experimental condition was added, but this was not a significant predictor of hamburger choice,  $p = .79$  (see Table 1 for comparisons).

Table 1

*Odds ratios of unhealthy food choice.*

	<i>B (SE)</i>	OR [CI]
Control vs. UDN	-0.54 (.57)	0.58 [0.19 - 1.78]
HDN vs. UDN	-0.35 (.72)	0.71 [0.17 - 2.89]
IN vs. UDN	-0.58 (.68)	0.56 [0.15 - 2.11]
Control vs. HDN	-0.19 (.57)	0.83 [0.27 - 2.54]
HDN vs. IN	0.23 (.68)	1.26 [0.33 - 4.76]
Control vs. IN	0.04 (.52)	1.04 [0.38 - 2.87]

*Note.* All  $ps > .34$ . UDN = unhealthy descriptive norm, HDN = healthy descriptive norm, IN = injunctive norm.

To test the hypothesis that a healthy descriptive norm, as well as a healthy injunctive norm would result in more *salad consumption* than an unhealthy descriptive norm or no norm message (control group), another hierarchical logistic regression analysis was run, comparing these four groups. Gender and habitual food choice were entered in the first step of the analysis. Gender was a significant predictor of food choice - women were more likely than men to choose a salad for lunch  $\beta$  (.56) = 1.61,  $p < .005$ , OR = 4.99 [CI = 1.68 - 14.86]. The habit to eat salads was also found to be predictive of whether people chose a salad for lunch,  $\beta$  (.50) = 3.79,  $p < .001$ , OR = 44.30 [CI = 16.70 - 117.53]. In the second step, experimental condition was added and was found to be a marginally significant predictor of salad choice,  $p = .06$  (see Table 2 for comparisons). The first hypothesis, that a healthy descriptive norm would result in higher salad consumption, was supported: the odds to have a salad for lunch were higher in the healthy descriptive norm condition than in both the unhealthy descriptive norm condition and the control condition.

The second hypothesis that the injunctive norm would result in higher salad choice was examined in the same way. The odds to have a salad in the injunctive norm condition, however, did not differ significantly from the odds to have a salad in the control condition. When comparing the injunctive norm condition to the unhealthy descriptive norm condition, a significant difference was found, such that those in the injunctive norm condition chose a salad for lunch more often than those in the unhealthy descriptive norm condition.

Table 2

*Odds ratios of healthy food choice.*

	<i>B (SE)</i>	<i>OR [CI]</i>
Control vs. HDN	1.40 (.70)*	4.05 [1.02 – 16.06]
UDN vs. HDN	2.52 (1.09)*	12.40 [1.47 – 104.86]
Control vs. IN	1.03 (.70)	2.80 [0.71 – 11.05]
UDN vs. IN	2.15 (1.09)*	8.58 [1.02 – 72.00]
IN vs. HDN	0.37 (.78)	1.45 [0.31 – 6.65]
Control vs. UDN	-1.12 (.97)	0.33 [0.05 – 2.18]

*Note.* \* $p < .05$ . UDN = unhealthy descriptive norm, HDN = healthy descriptive norm, IN = injunctive norm.

## DISCUSSION

The goal of this field study was twofold: to investigate the possibly adverse effects of unhealthy descriptive norms on dietary behavior and to investigate the beneficial effects of healthy descriptive and injunctive norms. Contrary to predictions, the unhealthy descriptive norm did not result in an increase in unhealthy food choice (i.e., burgers). The expected negative effect of unhealthy descriptive norms, however, did result in fewer healthy food choices, as those who were exposed to an unhealthy descriptive norm message chose salads less frequently than those in both healthy social norm conditions (i.e., descriptive, injunctive). So, some support was found for the hypothesis that unhealthy descriptive norm messages can negatively affect dietary behavior.

With regard to healthy social norms, it was hypothesized that both a descriptive as well as an injunctive norm message would have a positive effect on dietary behavior. This was supported. The healthy descriptive and injunctive norm message both

resulted in more healthy food choices than the unhealthy descriptive norm message. Further, the healthy descriptive norm message resulted in more healthy choices in comparison to the control group that received no message. The healthy injunctive norm message, however, did not differ from the control group (in its effects on food choice). A possible explanation for the difference in effectiveness of the healthy norm messages (compared to baseline) may lie in the fundamental differences between descriptive and injunctive norms. Whereas descriptive norms have been found to function as shortcuts in the decision-making process and influence behavior most strongly under conditions of low effortful cognitive activity, injunctive norms have been found to require higher levels of cognitive activity in order to influence choices (Jacobson et al., 2011). This might explain why a descriptive norm message resulted in significantly more healthy food choices, compared to the control group, while the injunctive norm message did not, in an on-campus food court, where a lot of distractions exist. But it also is likely that students already enter the situation with low levels of cognitive activity, through depletion as a result of class, a lecture, or study session. This aligns findings from Jacobson and colleagues (2011) where descriptive norms were found to be more effective than injunctive norms after class. The effect of different contexts on the influence of injunctive and descriptive norm messages on behavior is an idea worthy of further study.

Additionally results with regard to descriptive and injunctive norm perceptions point out that social norm messages, depending on whether they are injunctive or descriptive, can affect behavior in different ways. While descriptive norm messages affected behavior through changing descriptive normative beliefs, injunctive norms did not change and were merely made salient by an injunctive norm message. Because injunctive norms are relatively universal cultural standards on how to behave (Reno et al., 1993) - most people are already aware of what actions others approve or disapprove of and the injunctive norm message in this case brought this in focus. This aligns with the *Focus Theory of Normative Conduct* (Cialdini et al., 1990), as well as theory regarding health communication (Fishbein & Capella, 2006).

The current study extends prior research on social norms and dieting behavior by demonstrating that the influence of both healthy and unhealthy descriptive norms, and injunctive norms go beyond the laboratory environment (Burger et al., 2010) and affect dieting decisions in real-life situations. This approach of studying norms in the field is in line with much of the social norms research, mainly in the domain of environmental concern (e.g., Cialdini, 2005; Cialdini et al., 1990; Nolan et al., 2008), and is important

for multiple reasons, the most important factor being external validity. This study - high in ecological validity - confirms the assumption that social norms influence daily dieting decisions. This influence can be positive, but there is also an indication that this influence can be negative. The current study therefore demonstrates that findings in the field of social norms and dieting behavior, stemming from self-reports and laboratory experiments, can - to a large extent - be generalized.

It is worthy to note that highlighting healthy descriptive norms is effective in promoting healthy behavior. While this finding indicates that health campaigns can successfully promote healthy behaviors by making salient the preponderance of the behavior in a social environment, this strategy may not be possible if the preponderance of behavior is negative to begin with – if, for example, most people in the community practice unhealthy behaviors. In this case, it may be worth developing a strategic message frame that highlights the “special” nature of the few people who engage in the healthy behaviors. Indeed, the diffusion of innovations theory (Rogers, 1962) points out that innovators – who tend to be few in number – are often influential in propagating an innovation in society. Future research could investigate whether messages pertaining to prevalence of behavior are differentially influential, in comparison to messages pertaining to particular individuals.

Another strategy to adopt when the prevailing descriptive norm is unhealthy is to focus, instead, on healthy injunctive norms. We found, for example, that highlighting the healthy injunctive norm (“you should eat salad”) resulted in healthier choices, in comparison to highlighting unhealthy descriptive norms. While it is tricky to build campaigns on telling people what they should or should not do, due to potential reactance (Brehm, 1966), an injunctive norm message that stems from specific people with relevant expertise: “Your doctor believes you should exercise more often” may be somewhat more palatable than simply asserting “you should exercise more often.” This is, of course, speculative, but it is worthy of future research to investigate the extent to which injunctive norms emanating from various sources are more or less effective.

### *Limitations*

A limitation of the current study is that only one-fifth of the participants actually reported having been exposed to the normative messages. This means that, even though a certain written message is effective in stimulating health behavior, a prerequisite is that one pays attention to the message before it can actually influence behavior (McGuire, 1985). There are several ways in which attention for a message can



be increased, including by making the message more prominently visible and by using certain frames (Kahneman & Tversky, 1979). Social norms messages have also been found to be more effective if they closely match the social group of the recipient in terms of identification (Terry & Hogg, 1996). The match between the social norms message and its recipient, however, does not always have to be meaningful in terms of their shared group membership, but can also take other forms. To increase towel re-use, Goldstein, Cialdini, and Griskevicius (2008) tested several descriptive norm messages in which the level of similarity with the source was varied, by describing the source in terms of the larger society, gender congruence, and other fellow hotel guests. The message that had the most impact on behavior was the descriptive norm message that pertained to the towel re-use behavior of other guests in the same hotel-room. These factors should be taken into consideration when constructing a social norm message. This however does not take away from the central idea that exposure is a prerequisite for further effects to occur (McGuire, 1985).

Related to the previous point on message exposure, another limitation is that a large group of students in the experimental conditions were removed from analyses because they reported not seeing a sign upon entering the food-court. In the control condition only a small group of participants was removed from analyses (for the opposite reason of indicating to have seen a poster upon entering). This means that the composition of participants in the social norm conditions might be more homogeneous than in the control group. An alternative explanation might therefore be that this difference between the experimental conditions and the control condition is responsible for the differences found on food choice. This, however, seems unlikely, as the largest differences were found between the healthy and unhealthy social norm conditions. This makes it more likely that the social norm messages are indeed responsible for changes in food choices and that these findings are not merely an artifact of participant selection.

A final consideration is that the researcher was not blind to the conditions of the study. Every day the signs that conveyed the normative messages were set-up by the researcher who also handed out the questionnaires; this might have influenced the results. To this end, researchers –apart from certain constraints mentioned in the methods section –tried to distribute the questionnaires in a way that was as random as possible. Objective sales-data obtained from the food-court indeed indicated that this

random selection of participants was successful, as objective sales-data were in line with self-reported food choice obtained through the questionnaires<sup>1</sup>. This makes us more confident that the behavior data obtained through the questionnaires indeed reflects actual choices made by visitors of the food court.

### *Conclusion*

When generalizing these findings to a broader context, one has to conclude that those in health promotion should be reticent in the use of unhealthy descriptive norm messages, such as: 'The way we live nowadays means a lot of us, especially our kids, have fallen into unhelpful habits' (NHS, 2009), or 'Nine out of ten people eat less than the recommended two hundred grams of vegetables and two pieces of fruit a day' (Stichting Voedingscentrum Nederland, 2008), because these messages might adversely affect health behavior. Instead, health promoters should consider communicating a message that emphasizes the high prevalence of the healthy behavior of others (i.e., descriptive norm), or in cases where this is not possible - because most behave unhealthy - an alternative is to communicate a message that conveys how one should behave (i.e., injunctive norm).

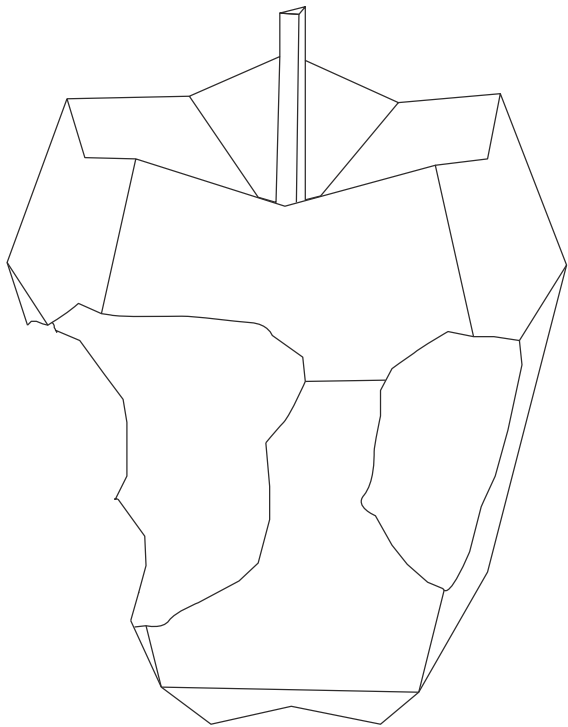
---

<sup>1</sup> Objective data concern the number of transactions of the salad bar and grill area the first day each sign was displayed. This was done because these data points resemble the self-reported data the most, because a single transaction reflects a single person in this case. Numbers salad choice: Injunctive #332; Healthy descriptive #357; Unhealthy descriptive #283; Control #273. Numbers burger choice: Injunctive #225; Healthy descriptive #177; Unhealthy descriptive #188; Control #148.



## CHAPTER 4

### INTERVENING OR INTERFERING? THE INFLUENCE OF INJUNCTIVE AND DESCRIPTIVE NORMS ON PROTECTIVE BEHAVIORS IN ALCOHOL CONSUMPTION CONTEXTS.



This chapter has been accepted for publication in a similar form as:  
Mollen, S., Rimal, R. N., Ruiter, R. A. C., Jang, S. A., & Kok, G. Intervening or interfering?  
The influence of injunctive and descriptive norms on intervention behaviors in alcohol  
consumption contexts. *Psychology & Health*.

**ABSTRACT**

In situations when people have been drinking it can be helpful to have friends tell them that it is better to stop drinking, or not drive home anymore. In general, however, most people want to avoid being seen as a busybody, which may inhibit advice giving. In the current study it was investigated how positive and negative descriptive and injunctive norms with regard to protective behaviors in alcohol consumption contexts, affect people's motivation to engage in pro-social (e.g., ask a friend to stop drinking) and pro-individual behaviors (e.g., let friends make their own drinking decisions). To this end an online experiment with a post-test was conducted. Results show that positive social norms resulted in a higher motivation to engage in pro-social behavior and a lower motivation to engage in pro-individual behavior, compared to negative social norms. Findings with regard to actual behavior show effects of injunctive, but not descriptive norms on pro-social behavior during the consecutive month. This is in line with prior findings regarding the transsituational influence of injunctive but not descriptive norms. Implications for theory and practice are discussed.

## INTRODUCTION

In general in Western cultures, there is an aversion against “sticking your nose where it does not belong”. A strong emphasis is placed on the freedom to make one’s own decisions (Schwartz, 2000). While advice can be perceived as helpful and supportive, it can also be perceived to be interference. Most people want to avoid being seen as a busybody - who meddles and pries into the affairs of others. As a result, the risk of being perceived to be butting in can inhibit people’s willingness to provide another person with advice (Goldsmith & Fitch, 1997). Unwillingness to provide others with advice can be problematic though, as an outside opinion at times may just be what is needed. This might be especially true in situations where alcohol is involved, as alcohol consumption has been tied to an impaired ability to make decisions (George, Rogers, & Duka, 2005; Lane, Cherek, Pietras, & Tcheremissine, 2004). In situations where people have been drinking it can for that reason be helpful to have a friend tell them that it is better to stop drinking, or not drive home anymore. The goal of the current study is to investigate how norms in favor and against pro-social actions in drinking situations influence people’s motivation to engage in protective behaviors.

### *Social norm approach*

It is clear that excessive alcohol consumption by college students is a serious issue, as it has been related to multiple negative outcomes such as academic performance (Wood, Sher, Erickson, & DeBord, 1997), aggression (Giancola, 2002), sexual victimization (Larimer, Lydum, Anderson, & Turner, 1999), and high-risk sexual behavior (Cooper, 2002). One of the problems underlying excessive drinking among college students is a discrepancy between perceived and actual drinking norms. Students share the tendency to overestimate how much others drink (i.e., descriptive norm), as well as the overall level of approval of heavy drinking (i.e., injunctive norm) (Borsari & Carey, 2003; Perkins & Berkowitz, 1986). The “social norms approach,” an intervention method designed to reduce heavy drinking, focuses on disseminating positive norms by communicating that most students either do not drink, or drink responsibly (Perkins & Berkowitz, 1986). Or that the uniformity of approval of drinking is not as high as one might think (for a review see, Prentice, 2008). The communication of lower drinking norms is thought to offset overestimations of drinking behavior among students and create new norms that will in turn guide alcohol consumption. This intervention method is so popular that about 48 percent of all 4-year residential

colleges and universities in the U.S. have tried this approach (Wechsler et al., 2003). The results from these interventions however have been mixed, while some have proven to be successful (e.g., DeJong et al., 2006; Turner, Perkins, & Bauerle, 2008), others have failed to encourage significant changes in alcohol consumption (e.g., Clapp, Lange, Russell, Shillington, & Voas, 2003; Granfield, 2005).

Like most other campaigns the social norms intervention conducted by Turner, Perkins and Bauerle (2008) disseminated messages that were designed to reduce misperceptions of drinking prevalence and perceived approval. However, in addition to that they communicated messages about protective behaviors, such as asking friends who had been drinking excessively to slow down, or not leaving a friend who had been drinking alone, and that these pro-social actions among peers were in fact the norm. As a result of their campaign (over a six year period) they identified a reduction in students suffering several negative consequences of alcohol consumption (e.g., having unprotected sex, getting into a fight) and a decline in odds for people to drink more than the legal limit last time they partied (eBAC > .08). These findings illustrate that a promising approach to reduce negative consequences related to alcohol consumption might be to communicate the normative nature of helping other people when partying and providing them with advice, even though it may be unsolicited. Messages conveying the high prevalence of pro-social behavior in alcohol consumption contexts might help people to overcome the idea that an advice-giver is interfering and could increase a person's motivation to actually intervene.

### *Injunctive and descriptive norms*

Social norms have been found to be a consistent factor in the prediction of a multitude of health behaviors (for a review see, Godin & Kok, 1996). The Focus Theory of Normative Conduct by Cialdini, Reno, and Kallgren (1990) proposes that a distinction needs to be made between descriptive and injunctive social norms. Descriptive norms refer to perceptions of, or actual behavior of most others. Injunctive norms reflect perceptions of or actual levels of others' approval or disapproval of certain behaviors (Cialdini et al., 1990). A second premise within the Focus Theory of Normative Conduct is that social norms should primarily be predictive of behavior when they are made salient or are otherwise focused on by an individual. So, people are most likely to conform to descriptive or injunctive norms when normative considerations are at that moment salient to a given person.

Both injunctive and descriptive norms are predictive of alcohol consumption in college youth. Several studies have found that both descriptive and injunctive norms influence drinking behavior (LaBrie, Hummer, & Neighbors, 2008; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007). In addition to that moderators of the relationship between injunctive and descriptive norms and alcohol consumption have been uncovered, such as gender (LaBrie et al., 2008), believing that drinking is an integral part of student life (Crawford & Novak, 2010) and the reference group (e.g., Cho, 2006). Overall, findings in the field of alcohol consumption indicate that both injunctive and descriptive norms influence alcohol consumption.

Although injunctive and descriptive norms have been found to influence behavior, it has been suggested that they do so through different routes (Cialdini & Trost, 1998). Descriptive norms are thought to guide behavior because of the implied social proof: “if most others are doing it, then it must be the right thing to do” (Cialdini et al., 1990; Cialdini & Trost, 1998). They provide us with information on the right way to act and through that serve our goal of accuracy (Cialdini & Trost, 1998). In support of this idea, several studies found that descriptive norms are especially effective in situations that are unfamiliar, uncertain or ambiguous (Deutsch & Gerard, 1955; Griskevicius, Goldstein, Mortensen, Cialdini, & Kenrick, 2006; Tesser, Campbell, & Mickler, 1983). Because descriptive norms function as ‘social proof,’ they often function like a shortcut or heuristic in the decision-making process (Cialdini, 1984; Jacobson, Mortensen, & Cialdini, 2011).

Injunctive norms are thought to be effective because they serve our goal of affiliation. We conform to injunctive norms, because we have a desire to build and maintain meaningful relationships with others. Through strategic action we aim to obtain social approval, and avoid disapproval and other social sanctions (Cialdini & Goldstein, 2004; Cialdini et al., 1990; Deutsch & Gerard, 1955). The underlying idea here is: “if we do what others approve of they must approve of us too”.

In line with the theoretical distinction between injunctive and descriptive norms it has been found that they can differentially affect behavior. While injunctive norms tend to remain effective over situations, descriptive norms are most effective within the situation they were conveyed in (Reno, Cialdini, & Kallgren, 1993). This follows logically from the goals that are served by these norms. While the behavior of most others is a valid point of reference in one situation, it might not be in the next and does therefore not serve the goal of accuracy (Cialdini & Trost, 1998). In contrast to that, injunctive norms usually remain valid, because they tend to be broader and refer to



what is approved or disapproved of conduct within a culture in general and is therefore unlikely to change from situation to situation (Reno et al., 1993). In line with theorizing concerning the transsituational influence of injunctive norms Larimer, Turner, Mallett, and Geisner (2004) found in a study on descriptive and injunctive norms and alcohol consumption among students that descriptive norms were predictive of concurrent drinking, while injunctive norms were predictive of behavior one year later at follow-up.

### *Current study*

In the current study we do not focus on the influence of descriptive and injunctive norms on alcohol consumption, but on motivation to act pro-socially (i.e., protective) versus pro-individually (i.e., autonomous) in alcohol consumption contexts. Until now no prior experimental research has been conducted on the effects of messages conveying the (non-)normative nature of helping behavior in drinking situations, yet it is crucial to find out if norms indeed affect the motivation to perform these behaviors, as it can provide a promising avenue for future social norms campaigns (see Turner et al., 2008).

It is hypothesized that descriptive norms will have an immediate influence on motivation to engage in pro-social and pro-individual actions. More specifically, it is predicted that a positive descriptive norm conveying that it is in fact normal to help others in alcohol consumption contexts will increase people's motivation to do so, compared to negative descriptive norms conveying that it is the norm to let people make their own decisions in alcohol consumption contexts. It is expected that the latter group will be more strongly motivated to engage in pro-individual actions, compared to the former.

To the best of our knowledge no prior experimental research has been conducted comparing the influence of positive and negative injunctive norms on motivation, or behavior. Findings until now mainly stem from cross-sectional studies (e.g., Cho, 2006; Neighbors et al., 2007). Based on prior findings from cross-sectional studies, as well as theory regarding normative influence (Reno et al., 1993), we predict that injunctive norms will have the same direct effects on motivation as descriptive norms, but that they will have a differential effect on helping behavior one month later. More specifically, with regard to motivation we predict that positive injunctive norms will increase the motivation to engage in pro-social actions, compared to negative

injunctive norms, and that the latter compared to the former will increase people's motivation to engage in pro-individual behavior in alcohol consumption contexts.

Injunctive, but not descriptive, norms have been found to influence behavior across different situations (Reno et al., 1993). With regard to actual helping behavior during the consecutive month it is therefore expected that injunctive, but not descriptive norms will influence behavior across situations. Most helping behavior is therefore expected to result from a positive injunctive norm, compared to a negative injunctive norm.

### *Norm focus*

Written messages were used to induce injunctive and descriptive norms. In persuasive health messages there are two ways in which beliefs - in this case normative beliefs - can influence behavior. The first is to change beliefs and the second is through priming or making salient, already existing beliefs (Fishbein & Cappella, 2006). With priming strategies one can increase the accessibility of specific beliefs to increase their effect on subsequent actions. A social norm message may therefore influence motivation or behavior either through changing normative perceptions, or by making the norm salient. It is expected that due to the differential nature of injunctive and descriptive norms a norm message will differentially influence their respective norm perceptions.

With regard to descriptive norms what is done by most others in one situation may differ from another situation. For instance, when having a party at a friend's house it may be that everyone gets their own beers from the fridge, while the same is likely not true when going to a bar with those same friends. Perceptions of descriptive norms may therefore rather easily change, as it is adaptive to adjust one's perceptions to the norm of conduct in that particular situation. Injunctive norms however, are relatively universal cultural standards of conduct, whose influence transcends situations (Reno et al., 1993). An injunctive norm message will therefore more likely prime or make salient already existing beliefs about the acceptability of a certain behavior. In this case both injunctive normative beliefs, on the one hand keeping an eye on one's friends and on the other hand letting friends make their own decisions when at a party, are thought to be prevailing beliefs. It therefore depends on the injunctive norm message as to which belief is made salient. We therefore expect that descriptive norm messages will influence behavior through changing descriptive normative beliefs, while injunctive

norm perceptions will likely not change as a result of an injunctive norm message, but will merely be made salient.

## METHOD

### *Participants and Design*

A total of 274 participants from a Western European university were randomly assigned to one of 5 experimental conditions in a 2 (social norm: injunctive/descriptive) x 2 (valence: positive/negative) factorial design, with a no message control condition. From this sample 30 participants were removed because they did not completely finish the main part of the study. Thirteen people who did not complete the post-measurement of helping behavior four weeks later were retained however. Four people guessed the true intent of the study and were therefore removed from the sample. The final sample consisted of 240 participants (48 men;  $M_{age} = 21.30$ ;  $SD_{age} = 2.66$ ). After participation in the post-measurement four weeks after the main experiment, participants were fully debriefed and paid (i.e., course credit, or a gift coupon). The procedure was approved of by the local ethics committee.

### *Procedure, materials and measures*

The study was fully conducted online and participants were told that they were taking part in several independent studies that would take 25 to 30 minutes in total. All participants, irrespective of the experimental condition, started with several general questions, measuring demographic variables (i.e., gender, age, origin, native language, student classification, living situation, student organization membership) and variables specific to the topic of study, alcohol use (i.e., drinking onset, number of drinks a week), and helping behavior. Helping behaviors in drinking situations with friends were measured by asking: "In the last year, after one of your friends drank alcohol, which of these did you do?" (i.e., Asked him/ her to slow down their drinking, Asked him/ her to stop drinking, Told him/ her not go home with someone, Brought him/ her home, None of the above) and were asked to mark all those options that applied to them.

For those in the experimental conditions, this was followed by an "evaluation study" in which they were asked to rate the quality of an article; this article contained the positive or negative descriptive or injunctive norm manipulation. Each text discussed two pro-social behaviors in alcohol drinking situations, namely monitoring a friend's drinking behavior and making sure friends get home safely (i.e., positive) or

pro-individual behaviors, letting friends decide for themselves how much they want to drink and when to go home (i.e., negative). The texts were ostensibly from a new student magazine and were presented as a guide to student life. After a general introduction the norm messages were introduced. The *positively valenced descriptive norm* message stated: "When students are at a party: 1) The majority makes sure their friends don't drink too much. When students are out partying with their friends, about 90% report keeping an eye on how much their friends drink. 2) 75% report to take care of their friends. When going to a party with friends, the majority of students say they make sure everybody they came with gets home safely." While the *negatively valenced descriptive norm* message stated that: When students are at a party: 1) The majority does not try to determine how much their friends drink. When students are out partying with their friends, about 90% report they let them decide how much they want to drink themselves. 2) 75% report to let their friends do their own thing. The majority of students indicate that when they go to a party with their friends, they do not try to convince their friends to go home when they are the ones done partying. For the injunctive norm messages, the *positively valenced injunctive norm* read: "According to students, when you are at a party, you should: 1) Make sure your friends don't drink too much! If you are out partying with your friends keep an eye on how much they drink. 2) Take care of your friends! When going to a party with friends, make sure everybody you came with gets home safely." The *negatively valenced injunctive norm* on the other hand said: "According to students, when you are at a party, you should: 1) Not determine how much your friends drink! If you are out partying with your friends let them decide how much they want to drink. 2) Let your friends do their own thing! When going to a party with friends, don't try to convince others to go home when you are the one done partying." Those in the control group did not receive an evaluation text and proceeded to the subsequent part immediately.

Following the "evaluation study" (i.e., norm manipulations) participants proceeded to the next part, which was termed a general student survey. This consisted of two filler questionnaires (measuring cultural differences in self-construal; i.e., independence and interdependence). The first was the short version of Gudykunst's self-construal scale (Gudykunst et al., 1996). The second questionnaire was Aron's inclusion of other in self-scale (Aron, Aron, & Smollan, 1992).

The third and final part of the main study was termed the "student alcohol behavior survey" and in this part the outcome variables were assessed from which scores were computed to reflect motivation to engage in pro-social and pro-individual

party behavior related to drinking alcohol and going home. Motivation was assessed by asking participants about their behavioral intentions/ expectations, as well as their behavioral willingness to engage in pro-social and pro-individual party behavior. This was done to tap into both deliberate and non-deliberate pathways to action (see, Gibbons, Gerrard, Ouellette, & Burzette, 1998). In addition to that descriptive and injunctive norm perceptions were assessed.

*Behavioral willingness* to engage in behaviors related to pro-social and pro-individual party behavior were measured with eight items and related to a friend's alcohol consumption, as well as going home after a party. The first four items concerned *alcohol consumption* and began with the following statement: "Suppose you were at a party with a friend and he or she was drinking heavily and was getting quite drunk. Under these circumstances, how likely is it that you would do each of the following?: 1) Get your friend another drink; 2) Let your friend drink as much as he/ she pleases; 3) Express your concern and ask your friend to slow down; and 4) Tell your friend he or she cannot drink anymore. Participants had to rate on a 7-point scale how likely each response would be (1= *very unlikely*; 7 = *very likely*). The first two items reflecting pro-individual and the second two pro-social behavioral willingness related to drinking.

The last four items measuring behavioral willingness concerned *going home after a party* and started with the following statement: "Suppose you were at a party with a friend, both of you had been having quite a few drinks of alcohol and it was time for you both to go home, your friend does not want to go. Under these circumstances, how likely is it that you would do each of the following?: 1) Go home without your friend; 2) Stay a little while longer in the hope that your friends will soon change his or her mind, but eventually leave when he or she doesn't; 3) Ask someone you spoke to earlier to take your friend home when he or she leaves and leave without your friend; 4) Try to keep getting your friend to come along until he or she does. Participants again had to rate on a 7-point scale how likely each response would be (1= *very unlikely*; 7 = *very likely*). The first three items reflected willingness to engage in pro-individual behavior, while the last item reflects willingness to engage in pro-social party behavior.

*Behavioral intentions/ expectations* were measured with four items. Participants had to indicate on a 7-point scale how likely it was that they would do each of the following (1= *very unlikely*; 7 = *very likely*). "Next time you are at a party how likely is it that: 1) ...you will try to make sure your friends limit their intake of alcohol? 2) ... you will try to make sure none of your friend goes home alone? 3) ... you will let your

friends decide how much they want to drink themselves? and 4) ...you will let your friends party as long as they want to? The first two items reflected pro-social behavior related to: drinking and going home. The third and fourth item related to pro-individual behavior related to drinking and going home, respectively.

*Motivation to engage in pro-social party behavior* was computed from the relevant behavioral willingness and intentions items. Two scores were computed that reflected motivation to engage in pro-social party behavior. The first reflected pro-social motivation related to drinking and contained items 3) and 4) of the behavioral willingness scale related to drinking and intention item 1) ( $\alpha = .74$ ). For pro-social party behavior related to going home item 4) of the respective behavioral willingness scale and item 2) of the intention scale were averaged into a mean ( $r = .37$ ).

*Motivation to engage in pro-individual party behavior* was computed in the same way. Motivation to engage in pro-individual drinking behavior was computed by averaging items 1) and 2) of the respective behavioral willingness scale with item 3) of the intention scale ( $\alpha = .74$ ). Motivation to engage in pro-individual behavior related to going home was calculated by averaging item 1) through 3) of the behavioral willingness scale related to going home and item 4) of the intentions scale ( $\alpha = .61$ ).

### *Norm perceptions*

*Descriptive norm perceptions* were assessed with four items, in which participants were asked to indicate the prevalence (0% - 100%) of a certain behavior: the first two items measured the pro-social descriptive norm perceptions and the last two the pro-individual descriptive norm perceptions: "In your opinion, (...) what percentage of students keeps an eye on how much their friends drink? ...what percentage of students makes sure that all of their friends get home safely after going to a party? ...what percentage of students lets their friends decide how much alcohol they want to drink for themselves? ...what percentage of students does not interfere with the time that their friends go home?".

*Injunctive norm perceptions* were assessed with four questions, of which the first two measured pro-social injunctive norm perceptions and the last two pro-individual injunctive norm perceptions, related to drinking and going home, respectively. "How important do you think most students think it is to (...) keep an eye on how much their friends drink?", "... make sure their friends get home safely after going to a party?", "... let their friends decide how much alcohol they want to drink for themselves?", "... let their friends party for as long as they want to?". Participants had to answer on a 7-

point scale how strongly they thought other students felt about conducting these types of behaviors (1 = *not at all important*; 7 = *very important*).

#### *Post-measurement*

Four weeks after participating in the main part of the experiment, participants received an invitation to participate in the post-measurement (also online). The post-measurement took 5 minutes and they had to fill this out within two weeks. Participants were reminded to do so through an e-mail reminder every other day. In the post-test participants were asked to indicate whether in the previous month when one of their friends had been drinking they had engaged at least once in any of the previously specified help-behaviors: Asked him/ her to slow down their drinking, Asked him/ her to stop drinking, Told him/ her not go home with someone, Brought him/ her home, None of the above. After this participants were debriefed, thanked and compensated for their participation. A total of 94.58% of those who participated in the main experiment also participated in the post measurement. The difference in age between those who returned for the post measurement versus dropped out was marginally significant,  $F(1, 238) = 3.02$ ,  $p = .08$ ,  $\eta_p^2 = .01$ . There was no difference in composition of the group of dropouts and those retained in gender ( $p = .78$ ), or in type of manipulation ( $p = .42$ ).

#### *Statistical analyses*

To examine the effects of positively and negatively valenced norm messages as a deviation from baseline (i.e., control group), from each score the control group average for that particular variable was subtracted. The resulting scores reflect the deviation in a certain outcome variable resulting from a positive or negative injunctive or descriptive norm message. A negative score means that the motivation to engage in a certain behavior was lower as a result of the norms message, as compared to the control group that did not receive a message and vice versa for a positive score. First, analyses were conducted to see if the descriptive and injunctive norm messages resulted in differences in norm perceptions. After that the main analyses were conducted. This consisted of an overall analysis in which the effects of norm, valence and their interaction were tested on the main outcome variables, motivation to engage in pro-social and pro-individual behavior, as well as actual behavior at post-test. Following a significant interaction, specific effects per social norm-type (i.e., injunctive, descriptive) were tested.

## RESULTS

### *Norm perceptions*

*Descriptive norms.* To investigate whether the positive and negative descriptive norm messages affected perceptions of descriptive norms, a MANOVA was done on the four descriptive norm perception questions, with descriptive norm valence (i.e., positive, negative) as a between-subject factor. Valence of the descriptive norm message significantly influenced perceptions,  $F(4, 101) = 5.26, p = .001, \eta_p^2 = .17$ . The subsequent univariate tests were significant for pro-social descriptive norm perceptions related to drinking,  $F(1, 104) = 18.95, p < .001, \eta_p^2 = .15$ , and getting friends home safely after a party,  $F(1, 104) = 4.04, p < .05, \eta_p^2 = .04$ . The differences between both descriptive norm groups were non-significant for descriptive norm perceptions of pro-individual behaviors related to drinking,  $F(1, 104) = 2.30, p = .13, \eta_p^2 = .02$ , and going home  $F < 1$  (see Table 1 for means and SDs). Overall the means that were obtained confirm the hypothesis that descriptive norm perceptions change as a result of descriptive norm messages. Higher norm perceptions were found in the positive descriptive norm group for engaging in pro-social behavior and lower descriptive norm perceptions were found for engaging in pro-individual party behaviors, compared to the negative descriptive norm condition.

TABLE 1

*Means and (SDs) of descriptive norms perceptions to engage in pro-social and pro-individual party behaviors across the descriptive norm conditions.*

	Descriptive Norm	
	Positive <i>n</i> = 50	Negative <i>n</i> = 56
<b>Pro-social</b>		
DN - Drinking	15.25 (21.58)	-2.28 (19.88)
DN - Home	10.45 (19.16)	2.33 (22.08)
<b>Pro-individual</b>		
DN - Drinking	-7.64 (20.51)	-2.31 (15.58)
DN - Home	-2.42 (24.16)	1.64 (28.41)

*Note.* DN = descriptive norm.



*Injunctive norms.* To investigate whether the injunctive normative messages influenced perceptions of injunctive norms, a MANOVA was done on the four injunctive norm perception questions, with injunctive norm valence (i.e., positive, negative) as a between-subject factor. Valence of the injunctive norm message did not influence injunctive norm perceptions,  $F(4, 76) = 1.12$ ,  $p = .36$ ,  $\eta_p^2 = .06$ . This confirms the expectation that injunctive norms do not change as a result of a message and aligns with the conception of injunctive norms as universal cultural standards. For illustrative purposes the means and standard deviations are reported in Table 2.

TABLE 2

*Means and (SDs) of injunctive norm perceptions to engage in pro-social and pro-individual party behaviors across the injunctive norm conditions.*

	Injunctive Norm	
	Positive $n = 38$	Negative $n = 43$
<b>Pro-social</b>		
IN - Drinking	-.14 (1.37)	-.07 (1.23)
IN - Home	.23 (1.16)	-.01 (1.39)
<b>Pro-individual</b>		
IN - Drinking	-.29 (1.05)	-.10 (1.09)
IN - Home	-.25 (1.09)	.17 (1.01)

*Note.* IN = injunctive norm. Last item approached a level of significance ( $p = .08$ ).

### *Main analyses*

The full (M)AN(C)OVA models were tested for the outcome variables motivation to engage in pro-social and pro-individual behavior and actual helping behavior at post-measurement. The full models included the between-subjects factors (norm-type and valence) and their interaction as the independent variables and motivation to engage in pro-social behavior, pro-individual behavior, or actual helping behavior as the dependent variable.

*Pro-social motivation.* A MANCOVA (with gender as the covariate) was conducted on the full model. There was no main effect of norm,  $F < 1$ , nor an interaction of norm and valence on motivation to engage in pro-social party behaviors,  $F < 1$ . There was, however, a main-effect of valence,  $F(2, 181) = 7.13$ ,  $p = .001$ ,  $\eta_p^2 = .07$ . This indicates -

in line with prior findings - that injunctive and descriptive norms have comparable direct effects on motivation. The subsequent univariate tests showed significant differences between positive and negative valence for motivation to engage in pro-social behavior related to drinking,  $F(1, 182) = 14.34, p < .001, \eta_p^2 = .07$ , but not making sure friends get home safely,  $F(1, 182) = 1.36, p = .25, \eta_p^2 = .01$ . Those who had received a positive social norm message were more motivated to engage in pro-social actions related to drinking, than those who read a negative social norm message (see Table 3 for adjusted means and SDs).

*Pro-individual motivation.* Another MANCOVA (with gender as the covariate) was conducted. There was neither a main effect of norm,  $F < 1$ , nor an interaction between norm and valence,  $F < 1$ , on motivation to engage in pro-individual behavior. There was, however, a main-effect of valence,  $F(2, 181) = 3.61, p < .05, \eta_p^2 = .04$ . The subsequent univariate tests showed significant differences between positive and negative valence of the social norm for motivation to engage in pro-individual behavior related to drinking,  $F(1, 182) = 6.93, p < .01, \eta_p^2 = .04$ , but not motivation to engage in pro-individual behavior related to going home,  $F(1, 182) = 1.94, p = .17, \eta_p^2 = .01$ . Those who had received a negatively valenced social norm message were more motivated to engage in pro-individual behavior with regard to friends' drinking decisions, than those who read a positive social norm message (see Table 3 for adjusted means and SDs).

*Helping behavior.* To test the hypothesis that injunctive norms, but not descriptive norms would result in behavior change at post-test, two ANCOVAs (with the relevant help behavior type at pre-measurement as a covariate) were done. The first examined differences between positive and negative injunctive and descriptive norms on behaviors aimed at reducing or stopping a friend's drinking. There was no main effect of norm or valence,  $F_s < 1$ . As expected however, there was an interaction between norm and valence,  $F(1, 174) = 5.23, p < .05, \eta_p^2 = .03$  (see Table 3 for adjusted means and SDs). Simple-effects tests confirmed that there was no significant difference between a positively valenced and a negatively valenced descriptive norm in helping behavior during the consecutive month,  $F(1, 97) = 1.11, p = .29, \eta_p^2 = .01$ . In line with expectations a significant effect of injunctive norm messages on helping behavior was found on post-test,  $F(1, 76) = 4.27, p < .05, \eta_p^2 = .05$ . A positive injunctive norm produced more helping behavior, than a negative injunctive norm.

A second ANCOVA was done to study the effects of the social norms on helping behavior related to making sure friends arrive home safely, no effect of norm, or

valence was found,  $F_s < 1$ . Nor was there an interaction between both,  $F(1, 174) = 1.30, p = .26, \eta_p^2 = .01$ .

TABLE 3

*EMMeans and (SDs) of positively and negatively valenced social norms groups of motivation to engage in pro-social and pro-individual actions and actual behavior with regard to friends' drinking decisions.*

	Descriptive norm		Injunctive norm		Overall	
	POS	NEG	POS	NEG	POS	NEG
Pro-social	.25	-.43	.18	-.43	.21	-.43
Motivation	(1.24)	(1.21)	(1.03)	(1.18)	(1.15)	(1.19)
Pro-individual	-.22	.37	-.12	.18 <sup>†</sup>	-.17	.28
Motivation	(1.11)	(1.30)	(1.01)	(1.21)	(1.06)	(1.26)
Pro-social	-.19	-.09 <sup>†</sup>	.03	-.21	-.08	-.15
Behavior	(0.46)	(0.51)	(0.65)	(0.42)	(0.56)	(0.47)

*Note.* POS = positive, NEG = negative. <sup>†</sup>Comparison within norm, *n.s.*

## DISCUSSION

Protecting one's friends while out partying by asking them to slow down their drinking, or making sure they get home safely can provide a key to reduce negative outcomes of alcohol consumption among college youth (Turner et al., 2008). There may be barriers, however, to acting pro-socially in party situations, as people may be fearful that they will be perceived to be interfering (Goldsmith & Fitch, 1997). In the current study we therefore sought to examine the role of positive and negative descriptive and injunctive norms in people's motivation to engage in pro-social and pro-individual behaviors when partying with friends, as well as actual helping behavior.

It was predicted that injunctive and descriptive norms would have similar direct effects on concurrent motivation to engage in pro-social and pro-individual actions. A test of the full model on both outcomes confirmed this, as no interaction was found between norm (i.e., descriptive, injunctive) and valence (i.e., positive, negative), but only a main effect of valence of norms on motivation to engage in pro-social and pro-individual actions.

A positive social norm indeed resulted in stronger motivation to engage in pro-social actions, compared to a negative social norm, while a negative social norm led to higher motivation to engage in pro-individual behavior, compared to a positive social norm. These effects were found for actions regarding drinking (e.g., tell a friend to stop drinking, let your friend drink as much as he or she pleases), but not related to going home (e.g., make sure no-one goes home alone, let friends party as long they want to).

In addition to finding direct effects on motivation to engage in pro-social behaviors, we found that actual helping behavior during the consecutive month was influenced by the social norm messages. We found that a positive injunctive, but not descriptive, norm results in more pro-social behavior in alcohol consumption contexts, compared to a negative injunctive or descriptive norm, respectively. This confirms the hypothesis that injunctive, but not descriptive, norms influence behavior across different situations. This aligns with prior findings in the field of normative influence (Larimer et al., 2004; Reno et al., 1993).

To the best of our knowledge, the current study was the first to examine the influence of negative injunctive norms on motivation and behavior by means of an experiment. This strengthens findings in the field so far on the influence of injunctive norms, by showing causal links between the valence of an injunctive norm and the direction of its effects on motivation, as well as actual behavior.

In addition, results confirm that descriptive, but not injunctive norms are amenable to change by providing normative information by means of a written message. Descriptive norm perceptions aligned with the norm conveyed in the message consistent with changing beliefs (Fishbein & Cappella, 2006). Injunctive norms perceptions did not change as a result of an injunctive norm message, consistent with priming beliefs (Fishbein & Cappella, 2006). Both norms irrespective of a change in perceptions brought about changes in subsequent motivation. A shortcoming within the current investigation, however, is that we did not assess whether salience of the injunctive norm in fact increased as a result of the injunctive norm messages. Future research should explore enhanced methods to measure whether the activation of injunctive norms was indeed successful. Such measures should tap into normative salience and activation.

Remarkably enough the effects of descriptive and injunctive norm messages only manifested on pro-social and pro-individual actions with regard to drinking, not to getting friends home safely after a party. This might be the result of the items that were used to measure pro-social and pro-individual actions related to going home after

a party. The different items used to measure pro-social and pro-individual behavior related to going home might have been perceived as more ambiguous, than the items related to drinking, as was evidenced by a lower internal consistency of the scales. In the scenario pertaining to going home after a party, participants were asked how willing they were (after both the participant and his or her friend had been having quite a few drinks) to either go home alone, or stay with their friend at the party. While staying was intended to reflect pro-social action, deciding to go home without one's friend may also have been perceived as a wise decision, as it may reflect that the participant knew when it was time to leave. This could therefore have caused inconsistent responses to the items used to measure actions related to going home after a party, which could have rendered the measure unsuitable to detect differences between positively and negatively valenced social norm groups. Another explanation might lie in the fact that making sure friends get home safely after a party is a more costly action, than merely monitoring a friend's drinking. Getting a friend home safely implies that one has to walk or cycle home with a friend, before being able to return to one's own home. One exposure to a social norm message might therefore not be sufficient to increase motivation to make sure friends get home alright. Future research should examine if other measures or repeated exposure to normative messages might show enhanced effects of norm messages on motivation to engage in pro-social and pro-individual actions with regard to going home after a party.

### *Practical implications*

Results pertaining to the direct effects of descriptive and injunctive norms on motivation indicate that intervention efforts should focus on disseminating messages that convey the high prevalence of helping behavior or approval thereof among friends while partying, to increase people's motivation to keep an eye on friends' drinking. Additionally messages about the high prevalence of help-behavior will reduce people's motivation to leave drinking decisions completely up to their friends. Both the decrease in motivation to act pro-individually as well as increase in drive to act pro-socially can help to reduce excessive drinking among college students and thereby reduce negative alcohol related consequences (Turner et al., 2008).

In addition, findings show that messages conveying the high prevalence of negative behavior should be avoided. In prevention practice, there is an understandable, yet erroneous, tendency to try to encourage action against a problem by depicting it as regrettably frequent. For instance, messages conveying that about 75% percent of

young people binge drink on occasion or that young people drink more alcohol at increasingly young ages. Although the aim of these messages is to promote a healthier lifestyle and positive behavior change by informing people that these health issues are serious matters in need of attention, from a social influence perspective, such messages actually enforce the notion that behaving in an undesirable fashion is in fact normal (Cialdini, 2007; Mollen, Ruiter, & Kok, 2010). Results of the current study confirm this and indicate that such messages can in fact be counterproductive.

If, objectively, a greater number of people engage in an unhealthy than in a healthy behavior, highlighting a positive descriptive norm surrounding that behavior cannot be done truthfully (or with much credibility). In these cases, it can be beneficial to communicate an injunctive norm (Cialdini et al., 1990; Mollen et al., 2010). Findings from the current study demonstrate that an injunctive norm directly influences people's motivation to engage in pro-social actions. This in combination with other research in the field of social norms - that shows that bringing a positive injunctive norm in focus even when the descriptive norm is negative produces positive behavior change (Reno et al., 1993) - means that injunctive norms can provide a good alternative to descriptive norms in health communication.

Ultimately most health campaigns aim to produce behavior change. Results reconfirm that in this respect a distinction needs to be made between injunctive and descriptive norms. In the current experiment injunctive norms, but not descriptive norms were effective in producing actual behavior change. This is likely due to the differing nature of injunctive and descriptive norms. While descriptive norms point to what is effective within a certain situation, injunctive norms can influence behavior over situations, as they tend to convey universal cultural standards (Reno et al., 1993). This means that for descriptive norms to effectively influence health behavior they need to be communicated in the location where decisions regarding helping behavior are made, in this case that would mean a bar or a club. The current study also indicates that injunctive norms do not necessarily have to be conveyed within the specific context in which the helping behavior is to take place. Possible injunctive norm communication avenues can therefore be the university's newsletter or social network sites students frequent. Future research should explore which communication methods optimally aid the persuasiveness of descriptive and injunctive norms.

*Conclusion*

Findings from the current study indicate that both descriptive and injunctive norm messages influence people's motivation to prevent friends from drinking excessively. Communicating that it is normal or that people approve of giving advice to others in alcohol consumption contexts can bring people to the realization that they are intervening instead of interfering. The help provided as a result of this realization can be an important tool in reducing negative consequences related to drinking.

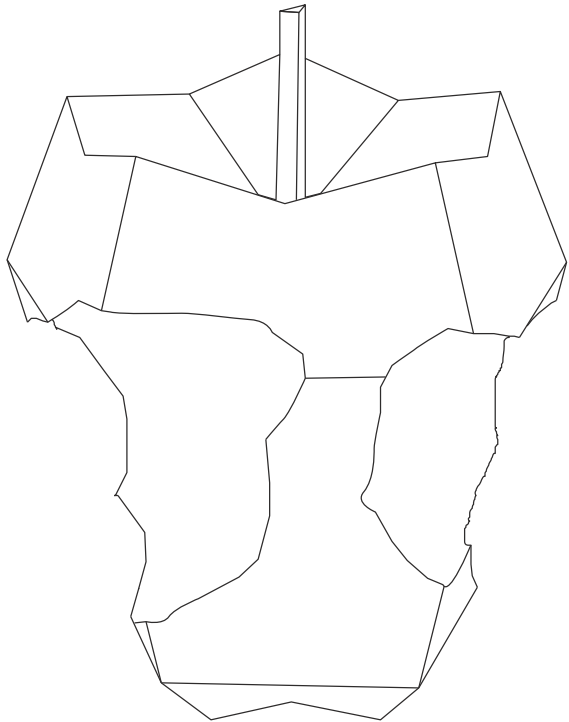






## CHAPTER 5

### WHEN THE FRAME FITS THE SOCIAL PICTURE. THE DIFFERENTIAL EFFECTS OF POSITIVE AND NEGATIVE FRAMING ON INJUNCTIVE AND DESCRIPTIVE SOCIAL NORMS



This chapter will be submitted for publication in a similar form as:

Mollen, S., Holland, R. W., Ruiter, R. A. C., Rimal, R. N., & Kok, G. When the frame fits the social picture. The differential effects of positive and negative framing on injunctive and descriptive social norms.

**ABSTRACT**

The goal of the current study was to investigate the differential effects of framing on injunctive and descriptive social norm messages. It was proposed that a negative frame would strengthen the persuasive effect of injunctive norms, while descriptive norms were expected to benefit from a positive frame. Participants were randomly assigned to one of five message conditions and read a positive or negative injunctive or descriptive norm message, or a control message. Subsequently, motivation was assessed through an approach-avoidance task. In line with expectations, results show increased approach motivation for fruit compared to candy in the injunctive negative and descriptive positive norm conditions, but not in the positive injunctive or negative descriptive norm conditions. Theoretical implications with regard to social norms theory and practical implications for interventions are discussed.

*"Thou shalt not kill"*

*"Thou shalt not steal"*

*"Thou shalt not commit adultery"*

## INTRODUCTION

Above are three examples of the Ten Commandments. All three are proscriptive norms, telling us what not to do. Eight of the Ten Commandments are framed negatively. This raises the question: are negatively framed norms more effective? And if so, why?

In social psychology, a clear distinction is made between two types of norms: injunctive and descriptive norms. Injunctive norms refer to how others think one should, or should not behave. Descriptive norms on the other hand refer to the behavior of most others (Cialdini, Reno, & Kallgren, 1990). A large body of research in different domains, such as accuracy judgment (Asch, 1956), energy conservation (Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008), stair-use (Burger & Shelton, 2011), food choice (Burger et al., 2010) and alcohol consumption (Neighbors et al., 2008), confirms the impact of injunctive and descriptive norms on behavior. So far, little research has been done on how message framing affects the effects of injunctive and descriptive norms on motivation and behavior. Message framing refers to the different ways in which a message formulates the choice, outcome or goal with respect to a behavioral decision (Levin, Schneider, & Gaeth, 1998). One way is to frame the behavioral outcome either in terms of gains or losses (Kahneman & Tversky, 1979). Or as in the Ten Commandments by emphasizing what one should or should *not* do, a prescriptive or proscriptive frame respectively.

Cialdini and colleagues (2006) investigated how framed injunctive and descriptive norm messages influence behavior. In a field study they investigated the amount of theft of petrified wood that took place in a national park in the U.S. as a result of differently framed injunctive and descriptive norm messages. It was hypothesized that a negatively framed norm message would be more effective because people have a negativity bias (e.g., Crawford & Cacioppo, 2002; Dijksterhuis & Aarts, 2003) and "in general, negative information is accorded greater attention, scrutiny, and weight in consciousness" (Cialdini et al. 2006, p. 4). To test this hypothesis, injunctive norm messages were constructed to communicate an anti-theft message by either urging visitors to leave petrified wood in the park (i.e., positive) or asking them not to remove petrified wood from the park (i.e., negative). And indeed the negatively framed

injunctive norm ('do not remove the petrified wood') more strongly reduced theft than the positively framed injunctive norm message ('leave the petrified wood in the park'). The highest theft rate was found in the negative descriptive norm condition ('many people take wood from the park'). The effects of the descriptive norm messages in this study, however, are more difficult to interpret in terms of framing. That is, the positively framed descriptive norm advocates for a positive behavior, while the negatively framed descriptive norm promotes negative behavior. Technically, this makes it impossible to interpret the findings related to descriptive norms in light of message framing.

The goal of the current study is to bridge this gap in the social norms literature by investigating the role of framing in descriptive norm messages and compare this to the role of framing in injunctive norm messages.

#### *Descriptive versus injunctive social norms*

Although both injunctive and descriptive norms have been found to influence behavior, it has been suggested that they do so through different routes (Cialdini & Trost, 1998). Descriptive norms are thought to guide behavior because of the implied social proof: "if most others are doing it, then it must be the right thing to do" (Cialdini et al., 1990; Cialdini & Trost, 1998). They provide us with information on the right way to act and with that serve our goal of accuracy (Cialdini & Trost, 1998). In support of this idea, several studies have found that descriptive norms are especially effective in situations that are unfamiliar, uncertain or ambiguous (Deutsch & Gerard, 1955; Griskevicius, Goldstein, Mortensen, Cialdini, & Kenrick, 2006; Tesser, Campbell, & Mickler, 1983). Because descriptive norms function as 'social proof,' they often function like a shortcut or heuristic in the decision-making process (Cialdini, 1984).

Injunctive norms are thought to be effective because they serve our goal of affiliation. We conform to injunctive norms, because we have a desire to build and maintain meaningful relationships with others. Through strategic action we aim to obtain social approval, and avoid disapproval and other social sanctions (Cialdini & Goldstein, 2004; Cialdini et al., 1990; Deutsch & Gerard, 1955). The underlying idea here is that if we do what others approve of, they must approve of us too.

In two studies, Jacobson and colleagues (2011) investigated whether the distinctive qualities of descriptive and injunctive norms underlie different cognitive processes. It was found that descriptive norms, because they function as a shortcut in the decision-making process are more influential under conditions of low effortful cognitive activity.

Injunctive norms on the other hand were found to require more effortful cognitive activity to be effective, because injunctive norms often result in a conflict between what one should do and what one actually would like to do (i.e., affiliative goals vs. personal goals). For framing this means that although more attention, scrutiny and cognitive effort resulting from a negative frame increases the impact of injunctive norms on behavior (Cialdini et al., 2006), the same might not be true for descriptive norms, because unlike injunctive norms, descriptive norms are more effective under conditions of low cognitive activity.

### *Framing and social norms*

Framing social norms entails that the same norm is presented in different formats. For instance, a dieting goal can be stimulated by presenting an injunctive norm message that conveys that most people approve of fruit consumption, or that most people disapprove of eating candy. Or, in case of a descriptive norm, that most people eat fruit, or do not eat candy.

Framing a social norms message means that the negative frame, in contrast to the positive frame, negates the fact that people do something undesirable. Negating a certain proposition reverses its truth-value. Negations are more difficult to process than regular (affirmative) propositions, because in memory the proposition is first stored as true, and only later a false label is attached to it (Gilbert, 1991).

Feelings of ease or difficulty with which a message is processed (i.e., processing fluency) can serve as a source of information. It can influence how we evaluate things and which processing style we adopt (Schwarz & Clore, 2007). Related to this, Alter, Oppenheimer, Epley, and Eyre (2007) hypothesized that people use metacognitive experiences of ease or difficulty when processing information as cues that guide their subsequent processing style. When a message is processed with ease (i.e., fluently), heuristic processing is sufficient, but when one experiences difficulty processing a message, this serves as a cue that an intuitive decision is probably incorrect and that systematic processing is warranted. In one study, particularly relevant in light of the current question, they investigated the effects of fluency on the effectiveness of a persuasive message about a consumer product. The disfluent condition - with a difficult to read masthead - triggered systematic processing and as a consequence product evaluations were more heavily influenced by the message containing strong arguments, related to price and storage capacity. In the fluent condition, however,

evaluations were influenced more by the message with the competent looking face (peripheral cue) and weak arguments related to popularity of the product.

We propose that positive and negative frames have a similar influence on processing style, in the sense that a negative frame - a negated message - makes people experience cognitive difficulty, which opens up resources and results in more cognitive capacity and therefore systematic processing of the message. Conversely, a positively framed message is processed with ease and does not signal the need for more cognitive capacity. Therefore heuristic processing is the result. Combining this with the fact that injunctive norms require more effortful cognitive activity than descriptive norms (Jacobsen et al., 2011) leads to the prediction that a negative frame (i.e., negation process, disfluent – systematic processing) enhances the effect of an injunctive norm, but not a descriptive norm message on behavioral motivation. The opposite is expected for descriptive norms. They are expected to influence motivation more strongly under conditions of low cognitive activity and therefore a positive frame (i.e., affirmation process, fluent – heuristic processing) is expected to increase its effect.

### *Current study*

In the current study we investigated the differential effects of framing on injunctive and descriptive norms. The messages concerned the goal to diet and either encouraged the consumption of fruit (i.e., positive frame) or the non-consumption of candy (i.e., negative frame). Because two different behaviors were the topic of study - fruit and candy consumption – and we were interested in effects on motivation towards the behavioral target, we used an approach-avoidance task (AAT). This method allowed us to measure and contrast approach motivation for fruit, as well as candy.

The reasoning behind the approach avoidance task is that humans usually show a spontaneous avoidance reaction to unpleasant, threatening stimuli, and a spontaneous approach reaction to pleasant stimuli. The AAT measures how fast these approach-avoidance reactions are made through arm movements. Avoidance is associated with pushing negative objects away from oneself, and therefore with moving the arms away from one's body. In contrast, approach to pleasant objects is associated with pulling the objects closer and therefore with moving the arm towards the body (Rinck & Becker, 2007). How fast participants approach versus avoid certain stimuli, tells us how positive and negative they evaluate these items, respectively. In this case participants had to respond as fast and accurate as possible to pictures of fruit and candy by

pushing them away from or pulling them towards themselves, by means of a joystick. We chose to use this task because it allowed us to measure motivation related to healthy and unhealthy aspects of diets, and because it is less sensitive to issues of social desirability.

We predicted that those who received a negative injunctive or a positive descriptive norm message would show a stronger motivation to diet. More specifically it was expected that those receiving a negative injunctive or positive descriptive norm message would show stronger approach motivation for fruit than candy, but that this would not be the case for those receiving a negative descriptive or positive injunctive norm message. A stronger motivation to diet can manifest itself through stronger approach motivation for fruit or weaker approach motivation for candy. Whether dieting motivation manifests itself through a stronger approach motivation for fruit or weaker approach motivation for candy might depend on whether the frame concerns the eating of fruit or the not eating of candy or the specific norm communicated (i.e., injunctive, descriptive). No prior studies were done examining the effects of framing on social norm message using this specific method; therefore, no specific hypotheses could be formed with regard to the relative advantage of approach motivation for fruit or disadvantage of approach motivation for candy.

### *Norm focus*

Written messages were used in the current study to induce injunctive and descriptive norms. In interventions there are two ways in which beliefs - in this case normative beliefs - can be used in messages to influence behavior. The first is to change beliefs and the second is through priming or making salient, already existing beliefs (Fishbein & Cappella, 2006). With priming strategies one can increase the accessibility of specific beliefs to increase their effect on subsequent actions. This aligns with one of the premises of the *Focus Theory of Normative Conduct* that social norms should primarily be predictive of behavior when they are made salient or are otherwise focused on by an individual (Cialdini et al., 1990). A social norm message may therefore influence motivation or behavior either through changing normative perceptions, or by focusing individuals on the norm. It is expected that due to the differential nature of injunctive and descriptive norms a norm message will differentially influence their respective norm perceptions.

With regard to descriptive norms what most others in one situation do may differ from what they do in another situation. While the behavior of most others is a valid



point of reference in one situation, it might not be in the next and therefore does not serve its underlying goal, the goal of accuracy (Cialdini & Trost, 1998). Perceptions of descriptive norms may therefore rather easily change, as it is adaptive to adjust your perceptions to the norm of conduct a particular situation. Injunctive norms however, are relatively universal cultural standards of conduct, whose influence transcends situations (Reno, Cialdini, Kallgren, 1993). An injunctive norm message will therefore more likely prime or make salient already existing beliefs about the acceptability of a certain behavior. In this case injunctive normative beliefs about approval related to fruit consumption, as well as disapproval related to candy consumption, are thought to be prevailing beliefs. It therefore depends on the injunctive norm message as to which belief is made salient. It is expected that descriptive norms will influence behavior through changing descriptive normative beliefs, while injunctive norm perceptions will likely not change as a result of an injunctive norm, but will merely be made salient.

## METHOD

### *Participants and design*

Eighty-eight students from a Western European university participated in this study for course credit, or €7,50 per hour. The experiment comprised a 2 (norm: injunctive or descriptive) x 2 (frame: positive or negative) mixed design, with an additional control condition. Participants were randomly assigned to one of the five conditions. All participants completed an AAT where they had to push and pull pictures of fruit, candy, and neutral items, with a joystick during six experimental blocks. Eleven participants were excluded from the analyses because they were allergic to one or more of the foods shown in the pictures, two were excluded because more than 10% of their responses were incorrect, one because of an incorrect recall of the normative message and one outlier (based on response latencies exceeding 3SD of the grand average score) was removed, resulting in the final sample of 73 participants ( $M_{\text{age}} = 21.48$ ,  $SD_{\text{age}} = 2.16$ ; 13 men).<sup>1</sup>

---

<sup>1</sup> An analysis was done that included all participants. Although the data pattern was similar, no significant interaction pattern between approach motivation for fruit and candy and norm and frame appeared ( $p = .11$ ). The same was true for the analysis that included people with allergies (but not those that were removed for other reasons;  $p = .16$ ). When only those with allergies were removed, but those removed for other reasons were retained, the interaction was significant ( $p = .01$ )

### *Materials and procedure*

Participants were seated behind a desk with a monitor and a joystick. All participants started with 15 practice trials, in which they could familiarize themselves with the procedures of the AAT. They were told that they would see pictures of chairs and tables (300 x 400 pixels). Participants were instructed to pull pictures of tables and push pictures of chairs and were told that in this round they would receive feedback on incorrect responses. When the joystick was pushed, the picture moved to the back and decreased in size; the opposite happened when the joystick was pulled. After completing the practice trials, participants proceeded to the actual experiment (see Table 1 for an overview of the procedure). The experiment started with one of four social norms texts, or the control text (depending on the experimental condition participants were assigned to). Participants were told that the article stemmed from a local student magazine. They were instructed to read the text thoroughly and were told that, later on in the experiment, questions would be asked related to the content of the article. This was done to ensure that participants would indeed read the message.

The *negative injunctive norm message* stated that most students at [name of university] are of the opinion that one should not eat candy when one fancies a snack. This was followed by: "Try eating candy less often, because eating candy is bad!" The *positive injunctive norm message* stated that most students at [name of university] are of the opinion that one should eat fruit when one fancies a snack. This was followed by "Try eating fruit more often, because eating fruit is good!" The *negative descriptive norm message* described that increasingly less people eat candy. It also stated: "More than 75% of students at [name of university] say they almost never eat candy when they fancy a snack". The *positive descriptive norm message* stated that an increasing number of people eat fruit. It also stated that: "More than 75% of students at [name of university] say they often eat fruit when they fancy a snack". The control condition received a text about findings from research on an unrelated topic (i.e., beneficial effects of swearing when experiencing physical pain).

TABLE 1  
*Schematic overview of experimental procedure*

Block	Content	Stimuli	# Trials
0	Practice trials	Neutral	15
<i>M</i>	<i>Norm manipulation</i>	<i>Text</i>	<i>N/A</i>
1	Neutral - Target	Fruit - neutral or Candy - neutral	40
2	Target – Neutral*	Fruit - neutral or Candy - neutral	40
3	Neutral - Target	Fruit - neutral or Candy - neutral	40
4	Target – Neutral*	Fruit - neutral or Candy - neutral	40
<i>M</i>	<i>Norm manipulation</i>	<i>Text</i>	<i>N/A</i>
5	Target– Target	Fruit - candy	40
6	Target– Target*	Fruit - candy	40

*Note.* An asterisk indicates a reversed direction in pulling and pushing of a certain category of pictures from the previous block. In between each block participants were asked to recall the text they had read (experimental manipulation).

After reading the social norms message, participants proceeded with the actual approach-avoidance task in which pictures of fruit, candy, and neutral items (i.e., closets) were used. The AAT consisted of a total of six experimental blocks, 40 trials each. Participants always started with a combination of fruit (or candy) with neutral pictures (i.e., first four blocks); the order of these picture combinations (i.e. fruit-neutral/ candy-neutral) was counterbalanced. The order of approach or avoidance responses was also counterbalanced. The order in which the pictures appeared on the screen was random; however, the number of pictures per block from each category (i.e., fruit, candy, neutral) was kept equal (50%/ 50%).

Before starting the first test-block participants received the instruction to pull pictures of one category (e.g., fruit) and push pictures of another category (e.g., neutral). When the first picture appeared on screen and the participant would pull the joystick, the picture would move to the bottom of the screen and increase in size, and when the participant would push the joystick the picture would move to the top of the

screen and decrease in size, this created a zooming effect. After the first block of 40 trials, participants were asked to think back on the content of the message they had read; for this they were presented with the border in which the message was originally presented, as a cue to recall. This was followed by a second block of 40 trials, but now participants would have to pull pictures they had just pushed and vice versa. After the first two blocks, participants received another request to recall the experimental text (with cue to recall) and proceeded with the following two blocks in which neutral pictures were combined with the other target pictures (i.e., fruit or candy). In between the third and fourth blocks, another cue to recall was given.

After finishing the first four blocks, instead of another cue to recall, the actual norm message was presented again for participants to read. Then participants started the last two blocks of trials in which pictures of fruit and candy were combined (no neutral pictures). The order of the last two blocks was determined by the previous (4<sup>th</sup>) block. If participants ended with pushing pictures of fruit, the fifth block would start with pulling fruit pictures and pushing candy pictures, and vice versa if they ended with pushing pictures of candy. In between the final two blocks another reminder of the experimental text (with cue to recall) was given. Each participant completed a total of six blocks of forty trials, resulting in a total of 240 trials.

### *Normative perceptions*

Following the AAT, several questions were asked to analyze whether or not the social norms messages influenced the perceptions of the descriptive and injunctive norms. For the *descriptive norm* perceptions two questions were asked pertaining to the consumption of fruit: “How often do you think students at [name of university] eat fruit when they feel like having something to eat in between meals?” (1= *never*, 6 = *always*) and “According to you, how large is the percentage of students at [name of university] who eat fruit when they feel like having something to eat in between meals?” (response options ranged from 0% to 100%, in intervals of 10%). The same questions were asked, but rephrased, for the consumption of candy. As for the *injunctive norms*, participants were presented with two statements: “Most students at [name of university] approve of me eating fruit when I feel like having something to eat in between meals” and “Most students at [name of university] disapprove of me eating candy when I feel like having something to eat in between meals” (1= *not at all*, 6 = *very much*).

### *Statistical analyses*

All incorrect responses in the AAT, as well as response times lower than 200ms and higher than 3 standard deviations above the mean, were removed from the dataset. From the remaining responses, means per block were calculated for approach and avoidance responses to pictures of neutral items, fruit, and candy, respectively. Subsequently approach motivation for fruit, as well as candy was computed by subtracting approach responses for a certain category of pictures (e.g., fruit) from avoidance responses of that category of pictures (e.g., fruit). Higher scores therefore reflect a higher approach motivation.

To analyze the effects of norms and framing on approach motivation, two mixed design ANOVAs were conducted, one for the first four blocks in which pictures of fruit or candy were combined with neutral items and one for the last two blocks in which pictures of fruit and candy were combined. In these ANOVAs, the between-subjects factors norm (i.e., descriptive, injunctive) and frame (i.e., positive, negative), and the within-subjects factor approach motivation type (i.e., neutral, fruit and candy), as well as their interactions were entered. If significant interactions arose between the within- and between-subject factors, further analyses were done to examine the direction of motivational effects. On the smallest level of the interaction, the reaction times were compared to those of the control group; this was done to contrast the direction of motivation against baseline responses.

## **RESULTS**

### *Norm perceptions*

To investigate if the descriptive norm messages affected perceptions of *descriptive norms*, a MANOVA was done on the four descriptive norm perception questions in which the all five conditions of the experiment were entered as one factor. The multivariate test proved significant  $F(16, 272) = 2.22, p = .005, \eta_p^2 = .12$ . All subsequent univariate tests were also significant ( $ps < .05$ ). Simple contrasts of the social norm conditions with the control group were conducted. In line with expectations both injunctive norm groups (i.e., positive, negative) did not differ significantly from the control group in their descriptive norm perceptions ( $ps > .30$ ). Simple contrasts of the descriptive norm conditions (i.e., positive, negative) with the control condition were in line with expectations. A positive descriptive norm message - about the high

prevalence of fruit consumption - resulted in higher norm perceptions regarding fruit consumption and a negative descriptive norm message - on the low prevalence of candy consumption - resulted in lower norm perceptions regarding candy consumption (see Table 2). Findings therefore align with the hypothesis that descriptive norm perceptions change in response to descriptive norm messages.

TABLE 2

*Results (means, SDs) of simple contrasts with the control group on descriptive norm perception.*

	Control	Descriptive positive	Descriptive negative
	<i>n</i> = 14	<i>n</i> = 14	<i>n</i> = 14
Frequency fruit	3.50 (.65)	4.21 (.80)*	3.57 (.94)
Percentage fruit	50.71 (18.17)	65.71 (15.55)**	52.14 (19.29)
Frequency candy	4.14 (.95)	3.93 (1.00)	2.93 (.73)***
Percentage candy	57.14 (20.16)	50.71 (20.56)	37.14 (15.90)***

*Note.* An asterisk indicates a significant difference with the control group of \* $p$  = .05, \*\* $p$  < .05, \*\*\*  $p$  < .005.

The same analysis was done to investigate whether the manipulation of injunctive norms influenced subsequent injunctive norm perceptions. The multivariate test, however, did not show a significant effect of condition,  $F(8, 136) = 1.80$ ,  $p = .08$ ,  $\eta_p^2 = .10$ . This confirms the expectation that injunctive norms do not change as a result of an injunctive norm message. For illustrative purposes Table 3 reports the means of both injunctive norm conditions (i.e., positive, negative) and the control condition.

TABLE 3

*Results (means, SDs) of simple contrasts with the control group on injunctive norm perception.*

	Control <i>n</i> = 14	Injunctive positive <i>n</i> = 16	Injunctive negative <i>n</i> = 15
Approval fruit	5.36 (.93)	5.56 (.63)	5.00 (.76)
Disapproval candy	3.00 (1.47)	2.06 (1.00)	2.40 (1.18)

*Note.* No significant contrasts with the control group were found. The contrast of the control with positive injunctive norm group on disapproval of candy did approach significance ( $p = .06$ )

### *Main analyses*

*Target versus neutral.* To test the hypothesis that the effectiveness of descriptive and injunctive norms depends on whether they are framed in a positive or negative manner, a repeated measures ANOVA was done, in which approach motivation for neutral and target pictures (i.e., fruit, candy) was compared<sup>i</sup>. The predicted interaction between experimental block (fruit-neutral/ candy-neutral), approach motivation type (food/ neutral), norm (injunctive/ descriptive) and frame (positive/ negative) was not significant,  $F < 1$ , suggesting that there was no indication for an enhanced effect of positive descriptive and negative injunctive norms on dieting motivation in the first four blocks.

*Fruit versus candy.* To test the hypothesis that framing would differentially affect the influence of injunctive and descriptive norms on motivation, another repeated measures ANOVA was done on the response times in the last two blocks, in which participants had to respond to pictures of candy and fruit<sup>ii</sup>. No between-subjects effects were found ( $ps > .30$ ).

<sup>i</sup> Whether people started the AAT with pictures of fruit or candy (i.e., order) was entered into the analysis as a covariate, but had no effect on the results and was therefore removed from the analyses. The same was true for gender.

<sup>ii</sup> Again no effect was found for order. There was a significant effect of gender ( $p < .05$ ), this, however, did not change the pattern of results and did not interact with either norm or frame. Therefore both gender and order were excluded from subsequent analyses.

A significant main effect of WS-factor approach motivation type did arise,  $F(1, 55) = 4.49$ ,  $p < .05$ ,  $\eta_p^2 = .08$ , showing that people had a higher approach motivation for fruit ( $M = 47.80$ ,  $SD = 68.71$ ) than for candy ( $M = 21.40$ ,  $SD = 56.54$ ). No two-way interactions were found between approach motivation type and norm or frame ( $F_s < 1$ ). In line with the expectations however a significant three-way interaction was found between approach motivation type, norm and frame,  $F(1, 55) = 5.99$ ,  $p < .05$ ,  $\eta_p^2 = .10$  (see Table 4).

TABLE 4

*Means (SDs) of response times (RTs) in AAT fruit and candy blocks. Also included are the fruit and candy approach motivation scores (push - pull) for the experimental conditions.*

	Descriptive norm		Injunctive norm	
Positive frame	Fruit	Candy	Fruit	Candy
Pull	566.95 (69.76)	620.38 (95.26)	553.16 (77.61)	560.43 (57.69)
Push	631.45 (74.40)	629.69 (71.02)	581.76 (69.17)	585.24 (66.18)
<b>Approach motivation</b>	64.50 (68.53)	9.30 (58.89)	28.60 (64.70)	24.81 (36.86)
Negative frame	Fruit	Candy	Fruit	Candy
Pull	604.51 (79.60)	599.94 (60.71)	553.56 (84.67)	582.68 (72.87)
Push	630.81 (70.71)	638.27 (87.06)	626.34 (88.45)	595.94 (72.23)
<b>Approach motivation</b>	26.29 (52.64)	38.34 (76.52)	72.78 (79.42)	13.26 (51.12)

*Note.* Control RTs: pull fruit 627.35 (76.69), push fruit 631.36 (59.45), pull candy 619.92 (73.64) and push candy 629.32 (105.34).

To examine whether approach motivation for fruit was stronger than for candy in each of the framed social norm conditions, four paired samples t-tests were done. In



line with expectations the differences between approach motivation for fruit and candy were significant in the negative injunctive,  $t(14) = 2.12, p = .05$  and positive descriptive norm condition,  $t(13) = 2.21, p < .05$ , but not in the positive injunctive or descriptive negative descriptive norm condition,  $t_s < 1$ . In line with expectations those in the negatively framed injunctive and positively framed descriptive norm conditions both showed a stronger approach motivation for fruit, than candy.

To investigate the direction of effects, the approach motivation scores for fruit and candy of the negative injunctive and positive descriptive norm condition were contrasted with the control condition in two univariate analyses of variance, in which all experimental conditions were entered as one factor. Contrast analyses with the control condition ( $M = 4.01$ ;  $SD = 59.72$ ) showed significantly higher approach motivation for fruit in both the negative injunctive,  $p < .01$ , and the positive descriptive norm condition,  $p < .05$ . With regard to approach motivation for candy no differences were found between the control condition ( $M = 9.41$ ;  $SD = 70.85$ ) and the negative injunctive or positive descriptive norm condition,  $p_s > .80$ .

## DISCUSSION

We sought to study the effects of framing on injunctive and descriptive social norms. First, we predicted that a negative frame would enhance the effect of an injunctive, but not a descriptive, norm message on motivation. Results confirm this hypothesis and indicate that it is indeed critical that the frame fits the characteristics of the communicated social norm for a message to effectively influence motivation. Injunctive norms require more cognitive activity (Jacobson et al., 2011), and so using a negative frame - that increases attention to the message (Crawford & Cacioppo, 2002; Dijksterhuis & Aarts, 2003) and triggers systematic processing through a metacognitive experience of difficulty while reading the message (disfluency; Alter et al., 2007) - enhanced the effect of the injunctive norm message in the present study. Second, we predicted that descriptive norm messages, that have a stronger influence on action under conditions of low cognitive activity, would be more influential when framed positively. This was indeed confirmed. That is, a positive frame – that is believed to trigger heuristic processes due to experienced cognitive fluency – increased the impact of descriptive norms on motivation.

The findings of the current study add to the field of social norms in two ways. First, the results support recent findings from Jacobson and colleagues (2011) that indicate

that injunctive norms require a higher level of cognitive activity in order to affect behavior, while descriptive norms are more effective under low elaboration. Second, these findings provide a more detailed and accurate account of the effects of message framing on social norms. While prior theorizing predicted a main effect of message framing, demonstrating stronger effects when using a negative frame (Cialdini et al., 2006), the current investigation shows that this is in fact dependent on the specific type of norm (i.e., injunctive, descriptive) and that while a negative frame is beneficial for injunctive norms, a descriptive norm benefits from a positive frame.

We argued that linking negative frames to injunctive norms and positive frames to descriptive norms would have stronger results on motivation because the frames activate the required processing style. In other words, the processing style triggered by the frame fits the requirement for processing the norm. However, an additional process may have boosted motivation as a function of this 'fit'. According to Higgins (e.g., Higgins, Idson, Freitas, Spiegel, & Molden, 2003), fit between different processing styles or orientations "feels right" and enhances the value and motivation of the outcome. Such experienced fit has been shown to affect the influence of persuasive communication (Cesario, Grant, & Higgins, 2004; for a review, see Cesario, Higgins, & Scholer, 2008), as well as fit between triggered and required processing styles (Avnet & Higgins, 2003, de Vries, Holland & Witteman, 2008). In our study the frame may not have merely activated the required processing style for certain norms, the fit between the frame and the norm may have felt right and enhanced the value of the persuasive communication. Whether a "fit experience" is indeed responsible for the current findings provides an interesting path for future research.

With regard to the manifestation of enhanced motivation to diet as a result of framed norm messages through increased approach motivation for fruit, or reduced approach motivation for candy, no prior findings were available, so no specific hypotheses were formed. Results show that enhanced motivation as a result of a negative injunctive or positive descriptive norm manifested itself through heightened approach motivation for fruit. It is noteworthy that independent of whether a norm message encouraged people to eat fruit or to refrain from eating candy, it resulted in heightened approach motivation for fruit. Future research should explore conditions that predict when specific messages motivate behavior through stronger approach motivation for fruit or weakened approach motivation for candy and whether the effects depend on specific framing of the message (i.e., positive, negative) or are the result of a specific norm type (i.e., descriptive or injunctive).

Increased motivation to diet as a result of a negative injunctive or a positive descriptive norm manifested itself through heightened approach motivation for fruit, but only when fruit was clearly positioned against candy (i.e., block 5 & 6). A possible explanation for this can be found in a study by Fishbach and Zhang (2008). They showed that when a picture of healthy food is presented apart from a picture of unhealthy food (instead of together in one picture) this results in direct competition between both food items. Competition between healthy and unhealthy food items is thought to cause the more important (health) goal to become activated. In the current experiment the direct contrast between pictures of fruit and candy (in block 5 and 6) could have caused people to become more strongly aware of the health goal that was activated by the negative injunctive or positive descriptive norm message, which might have strengthened the effects of the social norms messages on approach motivation for fruit.

The results from this study therefore indicate that in situations where someone is presented with a choice between a healthy or unhealthy snack, as is often the case in student cafés and employee-restaurants, a positive descriptive or negative injunctive norm will encourage people to choose a healthy snack over an unhealthy snack. Findings from this study also suggest that social norm campaigns can become more effective through framing. Communication of descriptive norms should emphasize what others do instead of do *not* do, and injunctive norms on the other hand should emphasize what others think one should *not* do instead of should do.

Additionally results with regard to descriptive and injunctive norm perceptions point out that social norm messages, depending on whether they are injunctive or descriptive, can affect behavior in different ways. While descriptive norm messages affected behavior through changing descriptive normative beliefs, injunctive norms did not change and were merely made salient by an injunctive norm message. Because injunctive norms are relatively universal cultural standards on how to behave (Reno et al., 1993) - most people are already aware of what actions others approve or disapprove of and the injunctive norm message merely brought this in focus. This aligns with the *Focus Theory of Normative Conduct* (Cialdini et al., 1990), as well as theory regarding health communication (Fishbein & Capella, 2006). Future research should however include measures that tap into normative focus and activation, rather than change to further study this proposed process.

A limitation of the current study was that it was conducted in an artificial environment (i.e., behavioral laboratory) in which people were instructed to read a

certain message. In reality people might not always be able to free up more cognitive capacity in response to negatively framed injunctive norm messages. This might mean that negative injunctive norms might not always be appropriate and effective and that therefore positive descriptive norms might have a stronger impact in some situations. Worthy of further study is therefore whether the same effects will be found outside the lab with actual behavior. And under which circumstances positive descriptive or negative injunctive norms are more effective.

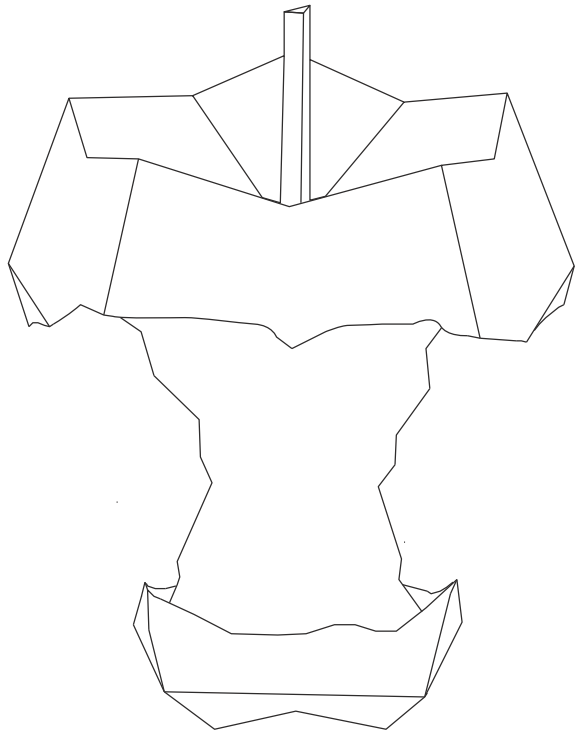
## CONCLUSION

The most important conclusion one can draw from the current research is that aspects related to the frame as well as the social norm should be carefully scrutinized before reaching conclusions regarding the effectiveness of certain social norm messages. A negative frame is not always more effective than a positive frame. Rather, it appears that normative appeals need to consider the interaction between the framing of the message and the type of norm that is being activated: injunctive norm messages should focus on what *not to do*, and descriptive norm messages should focus on what others *do*. In other words the frame needs to fit the social picture.



## CHAPTER 6

### GENERAL DISCUSSION





The main aim of the current thesis was to examine the potentially adverse effects of descriptive norm messages on health behavior. This research question was inspired by findings mainly in the field of environmental concern that show that descriptive norm messages that convey the predominance of undesirable behavior can encourage people to engage in the same undesirable behavior (e.g., Cialdini et al., 2006). We therefore contended that health messages that communicate the unhealthy behavior of most others are likely to be ineffective and may even adversely affect health behavior.

Several reasons may underlie this effect. For one, we may not be aware of the influence that social norms have on our behavior (Aarts & Dijksterhuis, 2003; Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008). Secondly, among those of us who do not exhibit the desired health behavior, such messages may provide no reason to change. Thirdly, among those of us who do seek to live healthily, the desire to conform to, rather than deviate from, social norms may reduce the motivation to exhibit the desired health behavior. Evidence for such a boomerang-effect has been found in the environmental domain (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007).

The second aim within this thesis was to investigate whether injunctive norms (i.e., what others approve or disapprove of) could provide a valuable alternative to descriptive norms in health communication messages (Cialdini, 2007; Mollen, Ruiter, & Kok, 2010). In addition to that we assessed how message framing could enhance the effectiveness of descriptive and injunctive norms on motivation to act healthy. Throughout the thesis the effects of descriptive and injunctive norms on varying health behaviors were examined, more specifically, exercise, food-choices, and helping behaviors in alcohol consumption situations. In this chapter we will discuss the outcomes with regard to descriptive and injunctive norms, as well as the effects of framing on the effectiveness of social norms messages. This will be followed by a discussion of the main limitations within this thesis and directions for future research that follow from these limitations, and we will conclude with recommendations for social norms communication practice.

### **(ADVERSE) EFFECTS OF DESCRIPTIVE NORMS**

Contrasting initial expectations, the effects of descriptive norms on health behavior were not as straightforward as anticipated at the outset of this thesis. While the results from Chapter 3 and 4 provide support for the hypothesis that descriptive norm



messages - that stress that a majority acts in an undesirable or unhealthy way - produce undesirable behavioral outcomes, results from the two experiments presented in Chapter 2, however, show contrasting findings. This suggests that descriptive normative influence is not as clear-cut as might generally be thought.

In the two experiments reported in chapter 2, the influence of unhealthy descriptive norms on daily health behaviors (i.e., stair-use, food-choice) was compared to the influence of healthy descriptive norms, as well as control groups that received no normative information. Findings show that healthy, as well as unhealthy descriptive norms can create an increase in daily health behaviors (i.e., stair-use and food choice), compared to a control group. This contrasts prior findings in the field of social norms that show that descriptive norms can have a positive, as well as negative influence on health behavior (e.g., Burger et al., 2010; Sieverding, Decker, & Zimmerman, 2010), but also other behaviors (e.g., Cialdini et al., 2006; Schultz et al., 2007), depending on the direction of the norms (i.e., positive vs. negative, healthy vs. unhealthy).

Zooming in on the effects in Chapter 2, in Study 1 it was found that an unhealthy descriptive norm message significantly increased stair-use (89.66%), compared to a control condition (62.07%). Stair-use as a result of a healthy descriptive norm message was also higher (80.77%) than in the control condition; this difference, however, was non-significant. When comparing this study to another recent study by Burger and colleagues (2010) that investigated the effects of healthy and unhealthy descriptive norms on food-choice, a very direct approach was taken in our study to manipulate descriptive norms (i.e., written messages embedded in a memory task). We proposed two possible explanations for the unexpected results. The first was that the explicit nature of written messages produced *reactance* in message recipients (Brehm, 1966). Explicit persuasive messages can backfire, because people may feel that they are being deprived of their freedom to make their own decisions. Reactance might have caused the participants to become less convinced by the healthy descriptive norm message and take an opposite course of action in response to an unhealthy descriptive norm message.

A second explanation might be that the experimental messages were presented as a memory task, which could have encouraged people to process the message centrally (Petty & Cacioppo, 1986). Central processing could have affected the results of the descriptive norm messages, as prior research shows that descriptive norms are especially effective under conditions of low cognitive activity (Jacobson, Mortensen, & Cialdini, 2011), because they function as shortcuts in the decision making process

(Cialdini, 1984). It was therefore thought that embedding a descriptive norm in a memory task might have resulted in weaker effects of the healthy descriptive norm and perhaps even the generation of counterarguments after exposure to an unhealthy descriptive norm, which consequently resulted in people taking an opposite course of action.

To rule out reactance and central message processing as potential alternative explanations for the findings in Study 1, in Study 2 (Ch. 2) the experimental procedure manipulated descriptive norms by means of contextual cues (indicating that most prior participants had either chosen a healthy or unhealthy reward), following the method used in a vast amount of prior research (e.g., Burger et al., 2010; Cialdini, Reno, & Kallgren, 1990; Keizer, Lindenberg, & Steg, 2008; Reno, Cialdini, & Kallgren, 1993). The aim was to reduce potential reactance to, and central processing of normative information. Contrary to expectations, however, the same unexpected effect was obtained in the second study, as it was found that healthy and unhealthy descriptive norms regarding food choice both resulted in healthier decisions, compared to a control group. In sum, both studies show that unhealthy influences in the social environment do not necessarily result in unhealthy behavior and provide evidence that reactance and central message processing are unlikely explanatory mechanisms of this effect. In Chapter 2 no support is found for the hypothesis that messages that stress the high prevalence of unhealthy behavior have adverse effects on health behavior.

In contrast to the findings in Chapter 2, results presented in Chapter 3 provide initial support for the hypothesis that unhealthy descriptive norms can have adverse behavioral effects. In this chapter findings from a field study (Study 3) were reported. In a college food court normative messages were displayed during a period of four weeks; that either conveyed the prevalence of healthy (i.e., salads) or unhealthy food choices (i.e., hamburgers). Results from this study show that even though unhealthy descriptive norms did not immediately result in an increase in unhealthy food choices (i.e., hamburgers), the predicted negative effect of unhealthy descriptive norms did show in a smaller number of healthy food choices being made, compared to the healthy descriptive norm. Those who were exposed to an unhealthy descriptive norm message chose to have a salad for lunch less frequently than those who were exposed to a healthy descriptive norm message. Additionally, it was found that those who received a healthy descriptive norm message chose a healthy food option more often, than those in the no-message control condition. Thus some support was found for the

hypothesis that unhealthy descriptive norm messages can negatively affect health behavior.

In addition to providing initial evidence for the adverse effects of unhealthy norm messages on health behavior, the field study extends prior research on social norms and health behavior (Burger et al., 2010) by demonstrating that both healthy and unhealthy descriptive norms affect dieting decisions in real-life situations. The approach of studying normative influence in the field is in line with much of the social norms research conducted, mainly in the domain of environmental concern (e.g., Cialdini, 2005; Cialdini et al., 1990; Nolan et al., 2008), and is important for multiple reasons, the most important factor being external validity. This study - high in ecological validity - confirms the assumption that descriptive norms can in fact influence daily dieting decisions. This influence can be positive, but there is also an indication that this influence can be negative. Study 3 therefore demonstrates that findings in the field of social norms and dieting behavior, stemming from self-reports and laboratory experiments, can - to a large extent - be generalized.

Further evidence for the adverse effects of descriptive norm messages comes from the online experiment presented in Chapter 4. In this study the potentially adverse effects social norms on protective behaviors in alcohol consumption contexts were examined. Findings from this experiment show that a negative descriptive norm message conveying that most people let their friends decide how much they want to drink for themselves, compared to a positive descriptive norm communicating that it is normal to make sure friends do not consume too much alcohol, reduced people's motivation to engage in pro-social behavior (e.g., tell a friend to stop drinking) and at the same time increased motivation to engage in pro-individual action (e.g., let your friend drink as much as he or she pleases). Thus providing additional evidence that norms conveying that a majority engages in undesirable behavior can produce adverse motivational effects.

These four studies show a relatively consistent pattern of findings with regard to the effects of positive descriptive norms - describing that a majority acts in a healthy or desirable way - on motivation and behavior. Throughout the reported studies these norms encouraged positive and healthy decisions. However, the effects of negative descriptive norms - describing that a majority acts in an unhealthy or undesirable manner - on health behavior, are less uniform. Two studies show that the latter norm can reduce healthy behavior (Ch. 3) and the motivation to engage in desirable behavior, additionally it can increase the motivation to engage in undesirable behavior

(Ch. 4). Two other studies (Ch. 2) point out that unhealthy descriptive norm messages can in fact increase healthy behavior. The latter findings, although not in line with the hypothesis, remain of interest, as they provide evidence that under some conditions it is possible to resist the negative influence from an unhealthy social environment. It is therefore essential that we know why and when this occurs as it can provide a key to successfully promote healthy conduct in the midst of increasingly unhealthy social environments.

### **MODERATORS OF NORMATIVE INFLUENCE**

One of the theories that specifies when and how descriptive norms will influence behavior is the *Theory of Normative Social Behavior* (TNSB; Rimal & Real, 2005). It proposes that the perceptions about the prevalence of a behavior in your social environment (i.e., descriptive norm), by itself, are not sufficient to instigate action. The TNSB proposes that certain moderators of the relationship between descriptive norms and intentions can aid the prediction of behavior change that results from descriptive norms. More specifically, the TNSB posits that descriptive norms can motivate you to act if you also (a) perceive social pressures to conform (i.e., injunctive norm), (b) perceive similarity with the referent group (i.e., group identity), (c) believe that performing the specific behavior will result in benefits (i.e., outcome expectations); or (d) view the behavior as central to your self-concept (i.e., behavioral identity).

In Study 2 (Ch. 2) we examined whether an additional moderator namely attitudes toward the health behavior in question could explain the unanticipated positive effects of negative descriptive norms on health behavior. It was hypothesized that people would not automatically follow norms outlined by the group when these group norms are in direct conflict with their own personal attitudes toward that behavior. That is, perceiving that many others engage in unhealthy behavior (i.e., unhealthy descriptive norm) was expected to be less likely to result in unhealthy behavior if you have a negative attitude toward this unhealthy behavior. And vice versa for healthy descriptive norms - perceiving that many others engage in healthy behaviors (i.e., healthy descriptive norm) will more likely result in healthy behavior, if you also have positive attitudes toward this healthy behavior. No indication was found, however, for a moderating role of attitudes in the relationship between healthy or unhealthy descriptive norms and health behavior. It is important though to acquire greater insight

into the boundary conditions under which unhealthy descriptive norm messages will have positive or negative effects on health behavior.

To shed some light on the unexpected findings in Chapter 2 we draw from research on self-regulation, as it provides insight into how health-related decisions are made. *Self-regulation* describes the ability (i.e., capacity) of human beings to prioritize one response over another. Regulation of behavior means that your behavior is brought in line with your ideals or goals (Baumeister & Vohs, 2007). Successful self-regulation demands prioritizing between goals that compete for resources or even between goals that are in direct conflict with one another, such as becoming slim and eating high-fat, high-fructose foods (Fishbach, Zhang, & Koo, 2009). The process of self-regulation plays an important part in determining health behavior and while it can follow conscious efforts it can also occur *automatically* (outside of conscious awareness) (Fishbach, Friedman, & Kruglanski, 2003). Applying this to healthy decision-making, automatic self-regulation for instance happens when you have the intention to lose weight. Recurring attempts at self-control when you are confronted with temptation (e.g., to eat chocolate) can result in facilitative and inhibitory links between tempting items and the long-term goals one has to maintain a healthy diet. Through time these links can become overlearned and work to guide healthy choices automatically. Evidence for this automatic link between temptations and goals to live healthy was found by Fishbach and colleagues (2003). Results from a lexical decision task showed that health goal related words (e.g., diet, slim) were recognized faster after being preceded by tempting food primes (50 ms; e.g., chocolate, cake), than irrelevant primes. This indicates that temptation related primes automatically activated concepts related to dieting, which made recognition of diet-related words faster (i.e., facilitation). This facilitation effect demonstrates that in some people temptations can automatically result in the activation of health goals. This is not the case for all people, however, because a facilitation effect was only found for those who valued the goal of weight watching and reported to be successful at dieting. Fishbach and colleagues also found that temptations do not merely activate higher order goals to live healthy, but that these activated health goals also result in more healthy behavior (in people who are used to dieting).

That health goals, but also success at performing these health goals, are a precondition of automatic self-regulation in response to temptations, was confirmed by Papies and colleagues. They only found a facilitation effect (i.e., faster recognition of diet related words after a temptation prime) among people with a high goal value who

also reported to be successful dieters. Conversely, temptation led to inhibition of diet goals in people who reported to be unsuccessful dieters. In those people, exposure to temptation leads to an activation of hedonic goals; goals related to pleasure (Papies, Stroebe, & Aarts, 2008).

Literature on self-regulation provides great insight into the processes that underlie health behavior in unhealthy (social) environments. Confrontation with temptations can lead to activation of health goals in some people, which in turn leads them to make healthier choices. Similar processes may be responsible for resisting temptations in social environments. Not conflicting attitudes as studied in Chapter 2, but goals may therefore lie at the core of the findings in Study 1 and 2. Unhealthy descriptive norms can be construed as temptations within a social environment. Confrontation with an unhealthy descriptive norm (e.g., most others take the elevator, or eat candy) might automatically activate long-term health-goals in people, which subsequently motivates them to make a healthy decision. This might provide a fruitful avenue for further study, as understanding what makes a person act healthily in an unhealthy social environment can provide a key to accelerate positive change in the midst of negative trends of increasing overweight and obesity rates (WHO, 2011).

### **INJUNCTIVE NORMS AS AN ALTERNATIVE**

In addition to studying the (adverse) effects of descriptive norm messages on health behavior, the role of injunctive norms as an alternative health communication strategy was investigated. Based on prior research by (Cialdini et al., 2006), we hypothesized that when unhealthy behavior is dominant, descriptive norms should not be conveyed in health promotion campaigns. In such cases injunctive norms should be communicated as they may offer an alternative and promising approach to promote health behavior change. In Chapter 3 findings from a field study were reported. As previously elaborated upon this study included healthy and unhealthy descriptive norm messages, but in addition to that an injunctive norm message that conveyed approval related to healthy food consumption (i.e., salads). Results indicate that an injunctive norm message indeed encourages more healthy choices than an unhealthy descriptive norm message. This supports our assumption that when a majority acts in an undesirable way it more advantageous to communicate injunctive norm messages than descriptive norm messages.

In contrast to the healthy descriptive norm message, the healthy injunctive norm message did not differ significantly from the control group in its effects on healthy food choice. It therefore appears that even though the difference between both healthy social norm messages was not statistically significant, healthy descriptive norms were somewhat more successful than injunctive norms in promoting healthy decisions. A possible explanation for the difference between both healthy social norm messages might lie in the fundamental differences between descriptive and injunctive norms. Whereas descriptive norms have been found to function as shortcuts in the decision-making process and influence behavior most strongly under conditions of low effortful cognitive activity, injunctive norms have been found to require higher levels of cognitive activity in order to influence choices (Jacobson et al., 2011). This might explain why in an on-campus food court, where a lot of distractions exist, the healthy descriptive norm message appeared to be somewhat more effective than an injunctive norm message. In addition to that it is likely that students already entered the situation with low levels of cognitive activity, through depletion as a result of class, a lecture, or study session. This aligns findings from Jacobson and colleagues (2011) where descriptive norms were found to be more effective than injunctive norms after class. How different social norm types, injunctive and descriptive, influence behavior in different contexts and situations and the role cognitive activity plays in this provides an interesting path for further study.

In Chapter 4 findings from another study into the effects of injunctive norms on health related behavior are reported. In this study both positive effects and negative effects of injunctive norms were examined. Based on prior findings from cross-sectional studies (Cho, 2006; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007), as well as theory regarding normative influence (Reno et al., 1993), it was predicted that injunctive norms would have the same direct effects as descriptive norms on motivation to act pro-socially (e.g., tell a friend to stop drinking) and pro-individually (e.g., let your friend drink as much as he or she pleases) in alcohol consumption contexts. A positive social norm (i.e., injunctive, descriptive) was expected to result in higher motivation to act pro-socially and a lower motivation to act pro-individually, compared to a negative social norm. However, a differential effect for injunctive and descriptive norms was expected on actual helping behavior during the consecutive month. Prior research has shown that injunctive, but not descriptive, norms influence behavior across different situations (Reno et al., 1993). It was therefore expected that with regard to helping

behavior injunctive, but not descriptive, norms would influence behavior during the consecutive month (i.e., across different contexts).

With regard to motivation to engage in pro-social actions in drinking situations comparable effects were found for injunctive and descriptive norms. A negatively valenced social norms message describing that you should not determine how much your friends drink, or that most people do not try to determine how much their friends drink, resulted in less motivation to act pro-socially, compared to a positively valenced social norms message describing that you should make sure your friends do not drink too much, or that the majority makes sure their friends do not drink too much. With regard to motivation to act pro-individually the overall analysis showed that a negative social norms message increased the motivation to act pro-individually, compared to a positive social norms message. The comparison between the positive and negative injunctive norms messages on motivation to act pro-individually, although in the same direction, showing a higher motivation to act pro-individually as a result of a negative injunctive norm, did not reach a level of significance. In addition to finding direct effects of injunctive norms on motivation to engage in pro-social behaviors we found that actual helping behavior during the consecutive month was influenced by the injunctive norms messages. Results show that a positively valenced injunctive norms message resulted in more helping behavior in alcohol consumption contexts, during the next four weeks than a negative injunctive norms message. This effect was not found for descriptive norm messages and confirms the hypothesis that injunctive, but not descriptive norms influence behavior across different situations: a finding that aligns with prior findings in the field of normative influence (Larimer, Turner, Mallett, & Geisner, 2004; Reno et al., 1993). This finding has important implications for health communication practice, which will be discussed later on in this chapter.

The contribution of this study is also relevant to theory, because to the best of our knowledge, this study was the first to examine the influence of negative injunctive norms on motivation and behavior by means of an experiment. This strengthens the mainly cross-sectional findings in the field so far on the influence of injunctive norms on motivation and behavior, by showing causal links between the valence of an injunctive norm and the direction of its effects on motivation, as well as actual behavior.

To summarize findings with regard to injunctive norms, the field study presented in Chapter 3 indicates that when a majority acts in an undesirable way it is indeed more effective to communicate a healthy injunctive norm, instead of a descriptive norm. This



notion is extended in Chapter 4 in an experiment on protective behaviors in alcohol consumption contexts. This study shows that the communication of positive social norms (i.e., injunctive, descriptive) is preferred over negative norms, as the latter can negatively influence health related motivation and behavior. This provides additional evidence for the hypothesis that in cases where a majority acts in an unhealthy way (or shares unhealthy beliefs about approval related to this behavior), this should not be emphasized in health communication, but should rather be counteracted through the communication of healthy social norms.

### **FRAMING SOCIAL NORMS**

In Chapter 5 we sought to study how message framing would affect the influence of injunctive and descriptive social norms on health behavior (i.e., motivation to consume healthy foods). Before this study, one prior study in the field of environmental concern investigated the effects of framing on descriptive and injunctive norms (Cialdini et al., 2006). Cialdini and colleagues hypothesized that irrespective of the type of norm (i.e., injunctive, descriptive) communicated a negatively framed norm message would more strongly influence behavior than a positively framed norm message, because people tend to have a negativity bias (e.g., Crawford & Cacioppo, 2002; Dijksterhuis & Aarts, 2003) and “in general, negative information is accorded greater attention, scrutiny, and weight in consciousness” (Cialdini et al. 2006, p. 4). To test this hypothesis, Cialdini and colleagues conducted a field study with the aim to reduce environmental theft. However, the framing effects in this study with regard to the descriptive norm messages are difficult to interpret in terms of framing. That is, the positively framed descriptive norm message advocated for a positive behavior, (‘majority of past visitors have left wood in the park’), while the negatively framed descriptive norm encouraged negative behavior (‘many people take wood from the park’). Technically, this makes it impossible to interpret the findings related to descriptive norms in light of message framing, as both frames should promote the same behavior (Levin, Schneider, & Gaeth, 1998). The goal of the study reported in Chapter 5 was to bridge this gap in the social norms literature and investigate the role of framing in descriptive norm messages and compare this to the role of framing in injunctive norm messages.

In contrast to the prior investigation by Cialdini and colleagues (2006), we predicted that due to the differential qualities and underlying goals of injunctive and

descriptive norms, positive and negative message frames would differentially affect the effect of injunctive and descriptive norms on motivation. More specifically, it was predicted that a negative frame would enhance the effectiveness of an injunctive, but not descriptive, norm message on motivation. Because injunctive norms require more cognitive activity (Jacobson et al., 2011), using a negative frame - that increases attention to the message (Crawford & Cacioppo, 2002; Dijksterhuis & Aarts, 2003) and triggers systematic processing through a metacognitive experience of difficulty while reading the message (Alter et al., 2007) - was expected to enhance the effect of the injunctive norm message. In contrast we predicted that descriptive norms - that have been found to be of stronger influence on behavior under conditions of low cognitive activity (Jacobson et al., 2011) - would be more influential when framed positively. That is, a positive frame - that is believed to trigger heuristic processing due to experienced cognitive fluency (Alter et al., 2007) - was expected to increase the influence of descriptive norms on motivation. Results showed that only a positive descriptive and negative injunctive norm message significantly increased motivation to consume healthy foods. This confirms our hypotheses and indicates that it is critical that a message frame fits the characteristics of the social norm communicated for a message to effectively influence motivation.

These findings add to the field of social norms in two ways. First, the results support recent findings from Jacobson and colleagues (2011) that indicate that injunctive norms require a higher level of cognitive activity in order to affect behavior, while descriptive norms are more effective under conditions of low cognitive activity. Second, these findings provide a more detailed and accurate account of the effects of message framing on social norms. While prior theorizing predicted a main effect of message framing, demonstrating stronger effects when using a negative frame (Cialdini et al., 2006), the current investigation shows that this is in fact dependent on the specific type of norm (i.e., injunctive, descriptive) and that while a negative frame is beneficial for injunctive norms a descriptive norm benefits from a positive frame.

### **LIMITATIONS AND FUTURE DIRECTIONS**

Within the studies outlined in this thesis there are three main issues that require discussion. The first is the inconsistency with regard to the (adverse) effects of unhealthy descriptive norms on health behavior. While two studies show that communications regarding the prevalence of unhealthy or undesirable behavior can

indeed adversely affect health motivation and behavior. Two other studies indicate that unhealthy descriptive norms do not necessarily encourage unhealthy decisions and can even spur people to make healthier decisions (Ch. 2). Apparently people are to a certain extent able to resist negative influences within their social environment. A limitation is that no direct explanation for this effect could be established within our line of research. Reactance and central message processing were ruled out as alternative explanations. Attitudes toward the behavior in question could also not explain this effect. Based on the findings in Chapter 2 we proposed that automatic self-regulatory processes might underlie this finding.

It is possible that upon confrontation with an unhealthy social environment, those who have a strong goal to live healthy and who are at the same time successful in their goal strivings automatically activate their goal to live healthily, which then guides subsequent actions. So far, little research has been done on the self-regulatory processes that underlie the influence of social environments on people's behavior. Research is needed to investigate whether automatic self-regulatory processes are indeed responsible for the current findings. Understanding what makes a person act healthy in an unhealthy social environment is critical, because it can provide the key to designing more effective interventions that accelerate positive change in the midst of negative trends in health behavior.

If research indeed confirms that self-regulatory processes underlie these unexpected effects of descriptive norms, intervention methods could focus on increasing successful self-regulation and inhibitory control processes specifically within social environments. Successful interventions have already been developed to train inhibitory control processes with regard to tempting food items. Houben and Jansen (2011) had chocolate lovers participate in a chocolate go/no-go task. Participants were either in a control condition, a chocolate-go, or a chocolate-no-go condition. In the critical chocolate-no-go condition, participants were trained to inhibit approach impulses towards chocolate. In this condition pictures of chocolate were consistently paired with a no-go cue, meaning that participants were not allowed to respond to chocolate pictures. The opposite was the case for the chocolate-go condition, and control participants were asked to respond on only half of the chocolate trials. After this task they participated in a chocolate taste test. They found that an increase in dietary restraint, which is comparable to having strong goals to diet, led to more chocolate consumption in the control condition, but in the intervention condition the opposite was true. It appears that these intervention techniques to train inhibitory

control can be a helpful tool in increasing self-regulatory success when confronted with temptations.

To be able to resist temptations in social environments, a similar intervention technique could be used, but should be tailored to resisting social temptations. In a *social self-regulation intervention* pictures of tempting items (e.g., beer, wine) could for instance be combined with words related to the social situation in which one is frequently confronted with certain kinds of temptations (e.g., party, group, friends), making a specific inhibitory response to the temptation embedded within the social situation. Repeated inhibition of responses tied to social stimuli could strengthen inhibitory control, especially in situations where social temptations are strongest. Once the proposed mechanisms have been found to play a role in resisting influence from an unhealthy social environment, these intervention techniques could aid those who have most difficulties in saying no to friends and family.

A second finding throughout the studies, which deserves additional attention, is that results consistently confirm that descriptive, but not injunctive, norms are amenable to change by providing normative information through written messages. In interventions there are two ways in which beliefs - in this case normative beliefs - can be used in messages to influence behavior. The first is to change beliefs and the second is through priming or making salient, already existing beliefs (Fishbein & Cappella, 2006). With priming strategies you can increase the accessibility of specific beliefs to increase their effect on subsequent actions. This aligns with one of the premises of the *Focus Theory of Normative Conduct* that social norms should primarily be predictive of behavior when they are made salient or are otherwise focused on by an individual (Cialdini et al., 1990). A social norm message may therefore influence motivation or behavior either through changing normative perceptions, or by focusing individuals on the norm.

It was expected that descriptive and injunctive norm messages would differentially affect behavior. While it was expected that a descriptive norm message would change descriptive norm perceptions, no such effect was expected for injunctive norm messages. This was expected because with regard to descriptive norms what is done by most others in one situation may differ from what is done in another situation. This means that while the behavior of most others is a valid point of reference in one situation, it might not be in the next and therefore does not serve its underlying goal, the goal of accuracy (Cialdini & Trost, 1998). Perceptions of descriptive norms may therefore rather easily change, as it is adaptive to adjust your perceptions to the norm

of conduct a particular situation. Injunctive norms, however, are considered to be relatively universal cultural standards of conduct, whose influence transcends situations (Reno et al., 1993). An injunctive norm message will therefore more likely prime or make salient already existing beliefs about the acceptability of a certain behavior, rather than change specific perceptions. It therefore depends on the injunctive norm message, which belief is made salient. Throughout the three studies in which descriptive and injunctive norms were studied (Ch. 3 - 5), it was indeed found that descriptive, but not injunctive, norm perceptions changed as a result of social norms messages. This was consistent over studies even though different wordings were used to inquire about injunctive norm perceptions: In the field-study (Ch. 3) it was asked whether participants thought it would be *appropriate* for them to order a tossed salad and hamburger for lunch. In the online study (Ch. 4) it was asked *how important* most students thought it was to engage in pro-individual and pro-social behavior in drinking contexts. Finally, in the framing study (Ch. 5) we asked about *approval or disapproval* related fruit and candy consumption, respectively. It is therefore highly unlikely that the lack of change found in injunctive norm perceptions can be attributed to a mere methodological error and it makes it more likely that it is in fact increased salience of the injunctive norms that caused the subsequent effects on motivation and behavior.

In this finding, however, also lies a shortcoming within the conducted research, as it was not directly assessed whether salience of the injunctive norm increased as a result of the injunctive norm messages. Such a measure should tap into normative salience and activation, instead of changes in perception. To measure salience and activation one would have to use measures that assess whether concepts related to injunctive norms become more accessible in the minds of the participants. Reaction time tasks would appear to be most suitable to measure accessibility. Such a task could measure whether people who read an injunctive norm message respond faster to concepts related to the injunctive norm, such as *approval, appropriate, should*. A measure like this, however, is quite difficult to implement in some types of research, such as research conducted in the field. An alternative in a field study (i.e., pencil-and-paper) could for instance be a word-stem completion task. Future research should explore which methods are suitable to measure if the activation of injunctive norms as a result of an injunctive norm message was indeed successful.

A final limitation and consideration for future research relates to the study on message framing and social norms. In this study it was predicted and found that

positive and negative message frames would differentially affect the influence of injunctive and descriptive norms on health motivation. More specifically, it was predicted that a negative frame would enhance the effectiveness of an injunctive, but not a descriptive norm message on motivation, while descriptive norms were expected to be more influential when framed positively. Framing a social norms message means that a negative frame in contrast to a positive frame negates the fact that people do something undesirable (i.e., descriptive) or describes that you should not engage in undesirable conduct (i.e., injunctive). Because negations are more difficult to process than non-negated messages (Gilbert, 1991), it was expected that this would result in experiences of disfluency, which have been associated with systematic processing (Alter et al., 2007). It was therefore hypothesized that because injunctive norms require more cognitive activity (Jacobson et al., 2011), a negative frame would enhance the influence of an injunctive norm message on motivation. Because descriptive norms have been found to be more influential under conditions of low cognitive activity (Jacobson et al., 2011), it was predicted that they would be more powerful when framed positively (i.e., fluent). Results indeed show that both a positively framed descriptive norm and a negatively framed injunctive norm produce changes in motivation.

A shortcoming within the framing study, however, is that the proposed underlying processes regarding the influence of negations on metacognitive experiences of disfluency were not directly assessed. So, it cannot be said with certainty that it is in fact a match between processing style and norm type that underlies the framing effects. Future research should therefore be undertaken to test the assumption that negated messages result in metacognitive experiences of disfluency.

In addition, the practical applicability of framed norm messages should be investigated, as the study was conducted in an artificial environment (i.e., behavioral laboratory) in which people were instructed to read a certain message. In reality people might not always be able to free up more cognitive capacity in response to negatively framed injunctive norm messages. This might mean that negative injunctive norms might not always be appropriate and effective and that therefore positive descriptive norms might have a stronger impact in some situations. Worthy of further study is therefore whether the same effects will be found outside the lab measuring actual behavior.

## RECOMMENDATIONS FOR NORMS COMMUNICATION

The studies presented in this thesis show that unhealthy descriptive norms do not per definition result in more unhealthy behavior and at times they may even encourage healthy behavior (Ch. 2). This does not mean, however, that communicating messages that describe the high prevalence of unhealthy behaviors, such as “Nine out of ten people eat less than the recommended two hundred grams of vegetables and two pieces of fruit a day” reflects good health promotion practice, as the boundary conditions under which these messages have a positive or negative effect on health behavior are still unknown. Two other studies presented in Chapters 3 and 4 indicate that unhealthy descriptive norms can indeed have adverse effects on health motivation and behavior, when compared to the effects of healthy descriptive norms.

Whenever possible it is therefore sensible to promote healthy behavior by communicating that most other people also behave in a healthy manner (i.e., descriptive norm), as it is an effective way to increase healthy choices (Ch. 3). While findings indicate that health campaigns can successfully promote healthy behaviors by making salient the preponderance of the behavior in a social environment, this strategy may not be possible if the preponderance of behavior is negative to begin with – if, for example, most people in the community practice unhealthy behaviors. In this case it is not possible to communicate a healthy descriptive norm message truthfully, or with much credibility, as one look into the environment will disprove the message communicated. Another strategy to adopt when the prevailing descriptive norm is unhealthy is to focus, instead, on healthy injunctive norms. Research in the field of environmental concern shows that bringing a positive injunctive norm in focus even when the descriptive norm is negative can produce positive behavior change (Reno et al., 1993), which means that injunctive norms can provide a good alternative to descriptive norms in situations where the majority acts in an undesirable way. In our own research we found that highlighting healthy injunctive norms (‘you should eat salads’) resulted in more healthy choices, compared to when an unhealthy descriptive norm was highlighted (Ch. 3). In Chapter 4, additional evidence was found that supports the notion that a message that communicates the prevalence of, or approval related to desirable behavior is preferable to communicating a message that describes the prevalence or approval related to undesirable behavior. In addition to that it was found that injunctive norms in contrast to descriptive norms influence behavior across different situations, as a significant effect of injunctive, but not descriptive, norms was

found on behavior one month later. The communication of positive injunctive norms can therefore be preferable at times, especially when it is not possible to communicate a healthy descriptive norm within the context in which the behavior is performed, for instance because this can not be truthfully (or credibly) done, or because the behavior is conducted in private (e.g., condom-use).

In sum, communicating positive norms that convey the prevalence or approval related to healthy behavior is superior to communicating messages that describe the pervasiveness of unhealthy behavior. Secondly, it depends on the context and type of behavior, whether injunctive or descriptive norms are appropriate to communicate. For descriptive norms to effectively influence health behavior they need to be communicated in the specific context in which decisions regarding health behavior are made. If one is able to do so and do so believably, then descriptive norm messages can effectively be used. If not injunctive norms form an effective alternative. Also if one does not have the possibility to communicate the norm within the context in which the behavior will be performed, injunctive norm messages will likely be superior to descriptive norm messages.

When one has decided based on the above criteria which norm is more appropriate for health communication, message construction can commence. Findings from this thesis (Ch. 5) suggest that the message frame should match the specific social norm communicated. Injunctive norms should describe what people should *not* do, instead of what they should do. Descriptive norms are more effective when they describe that most people make healthy decisions, compared to that most people do not make unhealthy decisions. Aspects related to the frame, as well as the social norm should be carefully scrutinized and whenever possible pilot-tested before reaching conclusions regarding the effectiveness of certain social norms messages (Whittingham et al., 2009; Whittingham, Ruiter, Zimbile, & Kok, 2008).

## CONCLUSION

Clearly, there is evidence suggesting that, when unhealthy behavior is highly prevalent, descriptive norms should not be conveyed in health promotion campaigns. In such cases, injunctive norms offer an alternative and promising approach to promote health behavior change. Although prior research as well as research within the context of the this thesis suggests that the use of descriptive norms can be disadvantageous when the undesirable behavior is highly prevalent, this may not be self-evident among

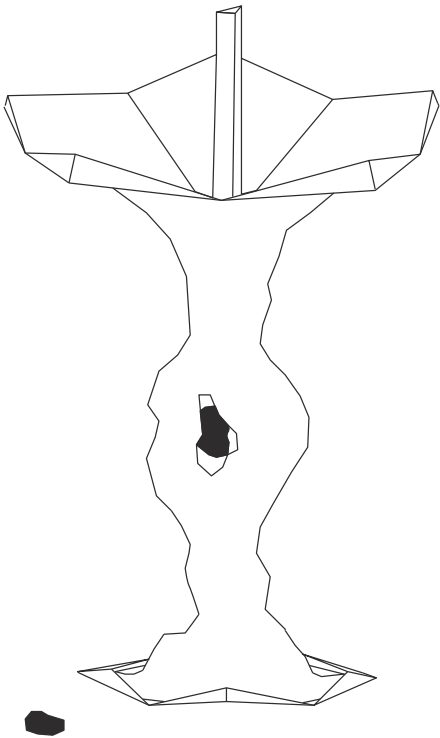


health promotion practitioners and policy makers. At the Petrified Wood National Park, this was clearly the case. Despite Cialdini et al.'s (2006) successful demonstration of a significant difference between the park's original approach in which the high rate of theft was communicated and the more advantageous injunctive norm messages stating one ought not steal, the park opted not to adopt the new strategy. To the park management, this approach was very counter-intuitive. They therefore asked a couple of park rangers to ask visitors which of the two messages they thought was most effective. The majority indicated they thought that the descriptive norm message was best and therefore the new more effective strategy was not adopted (Cialdini et al., 2006). The findings within the current thesis provide not only a deepened understanding of theory with regard to normative influence, but also provide tools and guidelines for those in health communication practice. Translation of the findings within the current thesis to practice is therefore imperative.





SUMMARY





In prevention practice, there is an understandable, yet mistaken, tendency to try to encourage action against a health problem by depicting the unhealthy behavior as regrettably frequent, such as: “Nine out of ten people eat less than the recommended two hundred grams of vegetables and two pieces of fruit a day”. Although the aim of these descriptive norm messages (i.e., what most people do) is to promote a healthier lifestyle and positive behavior change by informing people that these health issues are serious matters in need of attention, from a social influence perspective, such messages actually enforce the notion that behaving in an unhealthy way is normal.

Scientific findings, mainly stemming from the field of environmental concern, provide evidence for the assumption that when unhealthy behavior is highly prevalent, descriptive norms should not be conveyed in health promotion campaigns. In such cases, injunctive norm messages, conveying what most people approve or disapprove of, might offer an alternative and promising approach to promote health behavior change. The main objectives within this thesis were therefore to examine the propositions that messages stressing that a majority act in an unhealthy way can be counterproductive and that when this is the case, it is more advantageous to communicate what people should do (i.e., injunctive norm), rather than what they actually do (i.e., descriptive norm).

In four different experimental studies (Ch. 2-4) the potentially adverse effects of unhealthy descriptive norm messages on health motivation and behavior (i.e., diet, exercise, alcohol) were investigated. Moreover, two of these studies examined whether injunctive norm messages could provide a valuable alternative to descriptive norm messages in cases where a majority acts unhealthy (Ch. 3-4). In a fifth experiment (Ch. 5) we examined whether message framing could enhance the effectiveness of injunctive and descriptive norm messages on motivation to act healthily.

### **(ADVERSE) EFFECTS OF DESCRIPTIVE NORM MESSAGES AND INJUNCTIVE NORMS AS AN ALTERNATIVE COMMUNICATION STRATEGY**

In *Chapter 2* findings from two behavioral laboratory experiments were reported. The goal of these studies was to examine the possibly adverse effects of unhealthy descriptive norms on daily health behaviors, more specifically stair-use (Study 1) and food-choice (Study 2). To test the hypothesis that unhealthy descriptive norms would result in more unhealthy behavior, the relative influence of unhealthy descriptive norms on daily health behaviors was compared to healthy descriptive norms, and a

control group receiving no normative information. In both studies the immediate effects on actual health behavior served as an outcome measure. In the first study written messages embedded in a memory task were used to convey descriptive norms, while in the second study contextual cues were used to induce descriptive norms.

Contrasting initial expectations, in Study 1 it was found that an unhealthy descriptive norm message significantly increased stair-use, compared to a control condition. Stair-use as a result of a healthy descriptive norm message was also higher than in the control condition, this difference, however, did not reach a level of significance. We proposed that the type of norm communication method used in this study might have caused the unexpected results for two reasons: First, the explicit nature of the written messages may have produced reactance in message recipients, which subsequently could have caused the social proof in the messages to become less convincing. Second, presenting the experimental messages in a memory task may have encouraged central message processing. Because descriptive norms are thought to function as shortcuts in the decision making process, this may have resulted in weaker effects of the healthy descriptive norm and perhaps even the generation of counterarguments after exposure to an unhealthy descriptive norm, which consequently could have resulted in people taking an opposite course of action.

To rule out reactance and central message processing as potential alternative explanations for the findings in Study 1, in Study 2 (Ch. 2) the experimental procedure was adapted and healthy and unhealthy descriptive norms with regard to food-choice were induced by means of contextual cues. This follows the method used in a vast amount of prior research in the field of normative influence and was thought to reduce potential reactance to, and central processing of normative information.

Contrary to expectations, however, the same unexpected effect was obtained in the second study, as it was found that both healthy and unhealthy descriptive norms regarding food choice resulted in healthier decisions, compared to a control group receiving no normative information. Additionally, in Study 2 (Ch. 2) it was examined whether attitudes toward the health behavior in question moderated the relationship between descriptive norms and health behavior and could thereby explain the unanticipated positive effects of negative descriptive norms on health behavior. No indication was found, however, for a moderating role of attitudes in the relationship between healthy or unhealthy descriptive norms and health behavior.

Findings in Chapter 2 show that healthy, as well as unhealthy descriptive norms can encourage daily health behaviors (i.e., stair-use, food choice). This contrasts prior

findings in the field of social norms that show that descriptive norms can have a positive, as well as negative influence on (health) behavior, depending on the direction of the norms (i.e., positive vs. negative, healthy vs. unhealthy).

*Chapter 3* describes a study in which the possibly adverse effects of unhealthy descriptive norm messages on health behavior were examined within a naturalistic environment (Study 3). In contrast to the findings presented in Chapter 2, results presented in Chapter 3 provide initial support for the hypothesis that unhealthy descriptive norms can have adverse behavioral effects. Results showed that even though unhealthy descriptive norms did not result in an increase in unhealthy food choices (i.e., hamburgers), the predicted negative effect of unhealthy descriptive norms did result in a smaller number of healthy food choices (i.e., salads) being made, compared to a healthy descriptive norm. Those who were exposed to an unhealthy descriptive norm message were less likely to choose a healthy food option for lunch than those who were exposed to a healthy descriptive norm message. Thus some support was found for the hypothesis that unhealthy descriptive norm messages can negatively affect health behavior.

With regard to healthy social norms, it was found that those who read a healthy descriptive norm message chose to have a healthy lunch option more often, than those in the no-message control condition. In addition to that, those who saw an injunctive norm message were more likely to choose a healthy lunch option, than those exposed to an unhealthy descriptive norm message. This supports our assumption that when a majority acts in an undesirable way it is more advantageous to communicate injunctive norm messages than descriptive norm messages. In addition to providing initial evidence for the adverse effects of unhealthy norm messages on health behavior, this field study extends prior research on norms and health behavior by demonstrating that the influence of both healthy and unhealthy descriptive as well as healthy injunctive norms affects food-choices in real-life situations.

In *Chapter 4* findings from an online experiment into the positive and negative effects of descriptive and injunctive norms on helping behaviors in alcohol consumption contexts (Study 4) were reported. In this study descriptive norm messages were conveyed that either described the high prevalence of helping behavior (e.g., keeping an eye on friends' drinking), or high prevalence of behaviors that emphasize autonomy in drinking situations (e.g., letting friends make their own drinking decisions). Injunctive norms were communicated through messages that either described the approval of others related to helping behavior or autonomy in



drinking situations. The immediate effects of these messages on motivation to act pro-socially and pro-individually in drinking situations were tested, as well as actual helping behavior during the consecutive month. While descriptive, as well as injunctive norms were expected to have the same immediate effects on motivation, it was expected that injunctive norms would be more influential than descriptive norms at post-test, due to their ability to influence behavior transsituationally.

Findings from this experiment show that a negative descriptive norm message that emphasized the normative nature of autonomy, compared to a positive descriptive norm message that emphasized the normative nature helping, reduced people's motivation to engage in pro-social behavior (e.g., tell a friend to stop drinking) and at the same time increased motivation to engage in pro-individual action (e.g., let your friend drink as much as he or she pleases). The direct effects of injunctive norm messages on motivation were comparable to the effects of descriptive norm messages. Overall, findings align with the expectation that injunctive and descriptive norm messages have similar direct effects on health related motivation.

Concerning actual helping behavior in alcohol consumption contexts the expectation was that injunctive, but not descriptive norm messages would influence behavior across situations. Findings confirmed this hypothesis, as it was found that a positive injunctive norm message resulted in more helping behavior in alcohol consumption contexts during the consecutive month, than a negative injunctive norm message. No such effect was found for descriptive norm messages. This aligns with prior findings in the field of normative influence and theory regarding the transsituational influence of injunctive norms. Findings from this study provide additional evidence for the hypothesis that in cases where a majority acts unhealthy (or shares unhealthy beliefs about approval related to these behaviors) this should not be emphasized in health communication, but should rather be counteracted through the communication of healthy social norms.

In sum, the studies presented in Chapters 2 through 4 show that unhealthy descriptive norms can, as expected, reduce healthy behavior and increase unhealthy behavior (Ch. 3 - 4), but findings also show that this is not always the case, as at times they may even encourage healthy behavior (Ch. 2). The latter finding, however, does not mean that communicating messages that describe the high prevalence of unhealthy behaviors, such as "Nine out of ten people eat less than the recommended two hundred grams of vegetables and two pieces of fruit a day" reflects good health promotion practice, as the boundary conditions under which these messages have a

positive or negative effects on health behavior are still unknown. Whenever possible it is therefore sensible to promote healthy behavior by communicating that most other people also behave in a healthy manner (i.e., descriptive norm), as it is an effective way to increase healthy choices (Ch. 3).

With regard to healthy social norms findings indicate that health campaigns can successfully promote healthy behaviors by making salient the preponderance of the behavior in a social environment, this strategy may not be possible, however, if the preponderance of behavior is negative to begin with – if, for example, most people in the community practice unhealthy behaviors. In this case it is not possible to communicate a healthy descriptive norm message truthfully, or with much credibility, as one look into the environment would disprove the message communicated. Another strategy to adopt when the prevailing descriptive norm is unhealthy is to focus, instead, on healthy injunctive norms. In our research we found that highlighting healthy injunctive norms resulted in more healthy choices, compared to when an unhealthy descriptive norm was highlighted (Ch. 3). In Chapter 4, additional evidence was found that supports the notion that a message that communicates the prevalence of, or approval related to desirable behavior is preferable to communicating a message that describes the prevalence or approval related to undesirable behavior.

### **FRAMING SOCIAL NORM MESSAGES**

In the final empirical chapter (*Chapter 5*) we sought to study how message framing would affect the influence of injunctive and descriptive norms on health behavior (i.e., motivation to consume healthy foods). The goal was to investigate the role of framing in descriptive norm messages and compare this to the role of framing in injunctive norm messages. We predicted that due to the differential qualities and underlying goals of injunctive and descriptive norms, positive and negative message frames would differentially affect the influence of injunctive and descriptive norms on motivation. More specifically, it was predicted that a negative frame would enhance the effectiveness of an injunctive, but not a descriptive norm message on motivation. Because injunctive norms require more cognitive activity, using a negative frame - that increases attention to the message and triggers systematic processing through a metacognitive experience of difficulty while reading the message - was expected to enhance the effect of an injunctive norm message. In contrast we predicted that descriptive norms - that have been found to be of stronger influence on behavior under

conditions of low cognitive activity - would be more influential when framed positively. That is, a positive frame – that is believed to trigger heuristic processing due to experienced cognitive fluency – was expected to increase the influence of descriptive norms on motivation to consume healthy foods.

Results showed, in line with expectations that only a positively framed descriptive norm message, describing that most *do* eat fruit and a negatively framed injunctive norm message, describing that one should *not* eat candy, significantly increased motivation to consume healthy foods. These findings provide a more detailed and accurate account of the effects of message framing on social norms compared to prior research on the role of framing in social norm messages. While prior theorizing predicted a main effect of message framing, demonstrating stronger effects when using a negative frame, the current investigation shows that this is in fact dependent on the specific type of norm (i.e., injunctive, descriptive) and that while a negative frame is beneficial for injunctive norms a descriptive norm benefits from a positive frame. For norm messages in health communication this means that injunctive norms should describe what people should not do, instead of what they should do and descriptive norms should describe that most people do make healthy decisions, instead of that most people do not make unhealthy decisions.

## CONCLUSION

The findings within this thesis not only provide a deepened understanding of theory with regard to normative influence, but also provide tools and guidelines for those in health communication practice. Translation of the findings within the current thesis to practice is therefore imperative. In *Chapter 6* recommendations for the use of injunctive and descriptive norms in health communication are further discussed. In addition to that limitations and potential avenues for future research are discussed.





## SAMENVATTING



In de preventiepraktijk bestaat een begrijpelijke, maar foutieve neiging om gezondheidsgedrag te bevorderen door een bepaald gezondheidsprobleem neer te zetten als iets wat betreurenswaardig veel voorkomt. Een voorbeeld hiervan is: “Negen van de tien mensen eten minder dan de aanbevolen 200 gram groenten en twee stuks fruit per dag”. Hoewel het doel van dit soort descriptieve norm boodschappen (d.w.z., wat de meerderheid doet) is een gezondere levensstijl en positieve gedragsverandering te bevorderen, schuilt in deze boodschap de onderliggende mededeling dat het normaal is je ongezond te gedragen. Bijna iedereen doet het ten slotte.

Wetenschappelijke bevindingen, voornamelijk naar bevordering van milieubewust gedrag, leveren bewijs voor de aanname dat wanneer ongezond gedrag veel voorkomt, descriptieve norm boodschappen in gezondheidscommunicatie vermeden zouden moeten worden. In deze gevallen bieden injunctieve normen, dat wat anderen goed of afkeuren, een goed alternatief in het bevorderen van positief en gezond gedrag. De belangrijkste doelen binnen dit proefschrift waren dan ook te onderzoeken of boodschappen die communiceren dat de meeste mensen zich ongezond gedragen (d.w.z., descriptieve norm) inderdaad een negatief effect hebben op gezondheidsgedrag en of het in gevallen waarin de meeste mensen zich ongezond gedragen effectiever is te communiceren wat de meeste mensen goed of afkeuren (d.w.z., injunctieve norm).

In vier experimenten (Hfdst. 2 - 4) werden de mogelijk tegengestelde effecten van ongezonde descriptieve norm boodschappen op gezondheidsmotivatie en -gedrag (d.w.z., voeding, beweging, alcohol) onderzocht. Daarnaast gingen twee van deze studies in op de vraag of injunctieve norm boodschappen inderdaad een effectief alternatief voor descriptieve norm boodschappen zouden zijn in gevallen waarin de meerderheid zich ongezond gedraagt (Cap. 3 - 4). In het vijfde en laatste experiment werd onderzocht of ‘framing’ van norm boodschappen de effectiviteit van injunctieve en descriptieve norm boodschappen kon verhogen.

### **(TEGENGESTELDE) EFFECTEN VAN DESCRIPTIEVE NORM BOODSCHAPPEN EN INJUNCTIEVE NORMEN ALS EEN ALTERNATIEVE COMMUNICATIE STRATEGIE**

In *Hoofdstuk 2* werden de bevindingen van twee laboratoriumexperimenten gerapporteerd. Het doel van deze studies was de mogelijk tegengestelde effecten van ongezonde descriptieve normen op dagelijkse gezondheidsgedragingen (d.w.z., traplopen, voedingskeuze) te onderzoeken. Om de hypothese te testen dat een



ongezonde descriptieve norm boodschap tot meer ongezond gedrag zou leiden, werd de invloed van ongezonde descriptieve normen op dagelijks gezondheidsgedrag vergeleken met die van gezonde descriptieve normen en met een controlegroep die geen normatieve informatie ontving. De uitkomstmaat in beide studies was daadwerkelijk gezondheidsgedrag. In het eerste experiment werden geschreven boodschappen gepresenteerd in een geheugentaak om zodoende descriptieve normen te induceren, in het tweede experiment werd dit middels omgevingscues gedaan.

In tegenstelling tot initiële verwachtingen werd in Studie 1 gevonden dat een ongezonde descriptieve norm boodschap trapgebruik deed toenemen, vergeleken met de controleconditie. Een gezonde descriptieve norm boodschap leidde ook tot een toename in trapgebruik; het verschil met de controleconditie was echter niet significant. Mogelijke verklaringen voor deze onverwachte resultaten werden gezocht in het feit dat in dit onderzoek descriptieve normen werden gecommuniceerd middels expliciete boodschappen ingebed in een geheugentaak. De expliciete wijze waarop de normen werden gecommuniceerd kunnen mogelijkwijs weerstand (d.w.z., reactance) hebben veroorzaakt, waardoor de sociale bewijskracht zoals geleverd in de norm boodschappen als minder overtuigend werd ervaren. Daarnaast kan het inbedden van de norm boodschappen in een geheugentaak er voor gezorgd hebben dat mensen de boodschappen centraal zijn gaan verwerken, terwijl uit onderzoek juist blijkt dat descriptieve normen het meest invloedrijk zijn bij lage cognitieve activiteit, omdat ze vaak als snelle beslisregels worden gebruikt. Dit zou dan ook een reden kunnen zijn voor de zwakke effecten van gezonde descriptieve normen en wellicht het vormen van tegenargumenten bij confrontatie met ongezonde descriptieve normen en daaropvolgende gezondere keuzes.

Om weerstand en centrale verwerking als alternatieve verklaringen voor de bevindingen in Experiment 1 uit te kunnen sluiten werden in Experiment 2 descriptieve normen aangaande voedingskeuze gecommuniceerd middels omgevingscues. Dit is in lijn met een grote hoeveelheid eerder onderzoek in het veld van sociale normen en zou weerstand tegen normatieve informatie en centrale verwerking hiervan moeten reduceren.

In tegenstelling tot verwachtingen werd echter wederom hetzelfde effect met betrekking tot ongezonde descriptieve normen gevonden. Zowel gezonde als ongezonde descriptieve normen met betrekking tot voedingskeuze leidde tot meer gezonde keuzes vergeleken met een controlegroep die geen normatieve informatie ontving. In Experiment 2 werd tevens onderzocht of attitudes ten opzichte van het

(on)gezonde gedrag de relatie tussen descriptieve normen en daadwerkelijk gedrag kon verklaren; hiervoor werden echter geen aanwijzingen gevonden.

De bevindingen in Hoofdstuk 2 tonen aan dat zowel gezonde als ongezonde descriptieve normen dagelijkse gezondheidsgedragingen (d.w.z., trapgebruik, voedingskeuze) kunnen bevorderen. Dit contrasteert met eerdere bevindingen in het veld van sociale normen die laten zien dat descriptieve normen zowel een positieve als negatieve invloed kunnen hebben op (gezondheids)gedrag, afhankelijk van de richting van de descriptieve norm (d.w.z., positief vs. negatief, gezond vs. ongezond).

In *Hoofdstuk 3* is een studie beschreven waarin de mogelijk negatieve effecten van ongezonde descriptieve normen op gezondheidsgedrag werden onderzocht in een natuurlijke setting (d.w.z., mensa voor studenten). In tegenstelling tot de bevindingen in Hoofdstuk 2 toont de studie in Hoofdstuk 3 aan dat ongezonde descriptieve normen wel degelijk negatieve effecten kunnen hebben op gezond gedrag. Resultaten toonden namelijk aan dat hoewel een ongezonde descriptieve norm niet leidde tot meer ongezonde keuzes (d.w.z., hamburger) deze wel resulteerde in een reductie in gezonde keuzes (d.w.z., salades). Degenen die werden blootgesteld aan een ongezonde descriptieve norm waren minder geneigd een salade te kiezen voor de lunch, dan degenen die werden blootgesteld aan een gezonde descriptieve norm boodschap. Zodoende werd initieel bewijs gevonden voor de hypothese dat een ongezonde descriptieve norm boodschap een negatief effect kan hebben op gezondheidsgedrag.

Met betrekking tot gezonde sociale normen werd in deze studie gevonden dat degenen die een gezonde descriptieve norm boodschap gelezen hadden vaker voor een gezonde lunch kozen, dan degenen in de controleconditie. Daarnaast dat degenen die een injunctieve norm boodschap hadden gezien vaker een gezonde lunch namen, dan degenen die een ongezonde descriptieve norm boodschap hadden gezien. Deze bevinding levert bewijs voor de aanname dat wanneer een meerderheid zich ongezond gedraagt het beter is een injunctieve, dan een descriptieve norm te communiceren. Naast het leveren van initieel bewijs voor de tegengestelde werking van ongezonde descriptieve normen laat deze studie zien dat gezonde en ongezonde descriptieve normen, zowel als gezonde injunctieve normen, voedingskeuzes beïnvloeden in het dagelijks leven.

In *Hoofdstuk 4* werden de bevindingen beschreven van een online studie naar de positieve en negatieve effecten van zowel descriptieve als injunctieve normen op hulpgedrag in situaties waarin mensen alcohol consumeren. In deze studie werden descriptieve normen gecommuniceerd die ofwel het veel voorkomen van hulpgedrag

schetsten (bv., zorgen dat je vrienden niet te veel drinken), of juist het veel voorkomen van autonomie (bv., vrienden zelf laten beslissen hoeveel ze drinken) in situaties waarin mensen alcohol consumeren. Injunctieve normen werden gecommuniceerd middels boodschappen die ofwel beschreven dat andere mensen hulpgedrag, dan wel autonomie in situaties waarin mensen alcohol consumeren goedkeurden.

De directe effecten van deze boodschappen werden gemeten op de motivatie zich pro-sociaal, dan wel pro-individueel op te stellen in drinksituaties, zowel als daadwerkelijk hulpgedrag gedurende de volgende maand. De verwachting was dat de directe effecten van descriptieve en injunctieve normen op motivatie vergelijkbaar zouden zijn. Met betrekking tot de effecten op hulpgedrag een maand later werd echter verwacht dat injunctieve normen meer invloed zouden hebben dan descriptieve normen, vanwege het vermogen van injunctieve normen gedrag te beïnvloeden in verschillende situaties.

Bevindingen in dit experiment lieten inderdaad zien dat een negatieve descriptieve norm die de normatieve aard van autonomie beschreef, vergeleken met een positieve descriptieve norm die de normatieve aard van helpen benadrukte, de motivatie zich pro-sociaal te gedragen (d.w.z., een vriend(in) te vragen te stoppen met drinken) reduceerde en tegelijkertijd de motivatie verhoogde zich pro-individueel op te stellen (d.w.z., een vriend(in) zo veel laten drinken als hij/ zij wil). De directe effecten van injunctieve normen op motivatie waren vergelijkbaar met die van descriptieve normen. De resultaten met betrekking tot de directe effecten van injunctieve en descriptieve normen op gezondheidsmotivatie waren dus in lijn met verwachtingen.

Met betrekking tot daadwerkelijk hulpgedrag in situaties waarin mensen alcohol drinken was de verwachting dat injunctieve, maar niet descriptieve normen, gedrag zouden beïnvloeden in verschillende situaties. De bevindingen bevestigden deze hypothese en toonden aan dat een positieve injunctieve norm boodschap resulteerde in meer hulpgedrag gedurende de volgende maand, dan een negatieve injunctieve norm boodschap. Dit effect werd zoals verwacht niet gevonden voor descriptieve normen. Dit is in lijn met eerdere bevindingen in het veld van normatieve invloed en theorie aangaande de transsituatiele invloed van injunctieve normen. De resultaten van deze studie leveren aanvullend bewijs voor de hypothese dat wanneer een meerderheid zich ongezond gedraagt (of dit soort gedragingen goedkeurt) dit in gezondheidscommunicatie niet benadrukt, maar juist vermeden zou moeten worden.

Samenvattend laten de studies gepresenteerd in hoofdstukken 2 tot en met 4 zien dat ongezonde descriptieve normen, zoals verwacht kunnen resulteren in minder

gezond en meer ongezond gedrag (Hfdst. 3 - 4). Aan de andere kant tonen de bevindingen aan dat dit niet altijd het geval is, aangezien ongezonde descriptieve normen in sommige gevallen zelfs meer gezond gedrag tot gevolg kunnen hebben (Hfdst. 2). Deze laatste bevinding betekent echter niet dat boodschappen als “Negen van de tien mensen eten minder dan de aanbevolen 200 gram groenten en twee stuks fruit per dag” gebruikt zouden moeten worden in gezondheidsbevordering, aangezien het vooralsnog onbekend is wanneer dit soort boodschappen positieve, dan wel negatieve gevolgen op gezondheidsgedrag hebben. Het is dus verstandig gezond gedrag te bevorderen door middel van boodschappen die beschrijven dat de meeste mensen zich gezond gedragen (d.w.z., descriptieve norm), als dat mogelijk is.

Het is echter niet altijd mogelijk om deze strategie te gebruiken, bijvoorbeeld wanneer dit niet overeenkomt met de werkelijke situatie. Wanneer in de praktijk de meerderheid zich ongezond gedraagt is het niet mogelijk deze boodschap in alle eerlijkheid te communiceren, daarnaast zal een dergelijke boodschap weinig geloofwaardig zijn, omdat een blik richting de sociale omgeving deze boodschap direct zal ontkrachten. Een alternatieve strategie in gevallen waarin de meerderheid zich ongezond gedraagt is dan ook een injunctieve norm te communiceren. In ons onderzoek vonden we dat het onder de aandacht brengen van injunctieve normen resulteerde in meer gezonde keuzes, in vergelijking met een ongezonde descriptieve norm boodschap (Hfdst. 3). In Hoofdstuk 4 werd aanvullend bewijs gevonden voor de aanname dat een boodschap die de veelvoorkomendheid of goedkeuring ten aanzien van positief gedrag communiceert verkiesbaar is boven een boodschap die het veel voorkomen of goedkeuring van ongezond gedrag beschrijft.

### **FRAMING VAN SOCIALE NORM BOODSCHAPPEN**

In het laatste empirische hoofdstuk (*Hoofdstuk 5*) was het doel te onderzoeken hoe verschillende manieren van communiceren van een injunctieve of descriptieve norm hun respectievelijke effectiviteit zouden beïnvloeden. In dit hoofdstuk werd dan ook een studie gepresenteerd die de effecten van framing op descriptieve normen vergelijkt met die op injunctieve normen. De voorspelling was dat een negatieve frame de invloed van een injunctieve, maar niet die van een descriptieve norm boodschap op motivatie zou verhogen. Meer specifiek werd verwacht dat het gebruik van een negatieve frame de aandacht voor de boodschap zou verhogen en metacognitieve ervaringen van *disfluency* bij het lezen van de boodschap zou veroorzaken wat

vervolgens centrale verwerking in gang zou zetten en de effectiviteit van een injunctieve norm zou verhogen. Dit omdat injunctieve normen van meer invloed zijn gebleken onder condities van hoge cognitieve activiteit. Met betrekking tot descriptieve normen was de verwachting echter dat ze effectiever zouden zijn wanneer ze positief geformuleerd zouden worden, dit omdat descriptieve normen meer invloed hebben op gedrag bij lage niveaus van cognitieve activiteit. De verwachting was dan ook dat een positieve frame perifere verwerking zou induceren vanwege de ervaren metacognitieve *fluency* en zodoende de effectiviteit van descriptieve normen zou verhogen.

In lijn met de verwachtingen laten de resultaten zien dat louter een positieve descriptieve norm die beschreef dat de meeste mensen fruit eten en een negatieve injunctieve norm die beschreef dat je geen snoep zou moeten eten, de motivatie zich gezond te gedragen verhoogde. Terwijl eerder onderzoek een hoofdeffect van framing voorspelde (d.w.z., sterkere effecten bij negatieve framing), laat deze studie zien dat deze aanname genuanceerd zou moeten worden. Het is namelijk afhankelijk van het type norm dat gecommuniceerd wordt. Voor het gebruik van sociale normen in gezondheidscommunicatie betekent dit dat injunctieve norm boodschappen zouden moeten beschrijven wat anderen vinden dat je *niet* zou moeten doen, in plaats van wat je wel zou moeten doen. Descriptieve normen daarentegen zouden moeten beschrijven dat de meeste mensen gezonde keuzes maken, in plaats van geen ongezonde keuzes maken.

## CONCLUSIE

De bevindingen in dit proefschrift bieden niet alleen een dieper inzicht in de theorie aangaande normatieve invloed, ze bieden ook handvaten en richtlijnen voor professionals in de praktijk van gezondheidscommunicatie. Een vertaling van de huidige bevindingen naar de praktijk is dan ook essentieel. In *Hoofdstuk 6* worden aanbevelingen gedaan voor het gebruik van injunctieve en descriptieve normen in gezondheidscommunicatie. Daarnaast worden beperkingen van het huidige onderzoek en mogelijkheden voor vervolgonderzoek besproken.





## REFERENCES





- Aarts, H., & Dijksterhuis, A. (2003). The silence of the library: Environment, situational norm, and social behavior. *Journal of Personality and Social Psychology*, 84, 18-28.
- Acock, A. C., & DeFleur, M. L. (1972). A Configurational Approach to Contingent Consistency in the Attitude-Behavior Relationship. *American Sociological Review*, 37, 714-726.
- Aiken, L. S., & West, S. G. (1990). *Multiple Regression: Testing and Interpreting Interactions*. Newbury Park, CA: Sage Publications.
- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckman (Eds.), *Action-control: From cognition to behavior* (pp. 11- 39). Heidelberg, Germany: Springer.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211.
- Alter, A. L., Oppenheimer, D. M., Epley, N., & Eyre, R. N. (2007). Overcoming intuition: Metacognitive difficulty activates analytic reasoning. *Journal of Experimental Psychology: General*, 136, 569-576.
- Andrews, K. H., & Kandel, D. B. (1979). Attitude and Behavior: A Specification of the Contingent Consistency Hypothesis. *American Sociological Review*, 44, 298-310.
- Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of Other in the Self Scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology*, 63, 596-612.
- Asch, S. E. (1956). Studies of independence and conformity: I. A minority of one against a unanimous majority. *Psychological Monographs*, 70.
- Avnet, T., & Higgins, E. T. (2003). Locomotion, assessment and regulatory fit: Value transfer from "How" To "What". *Journal of Experimental Social Psychology*, 39, 525-530.
- Bagozzi, R. P., & Schnedlitz, P. (1985). Social Contingencies in the Attitude Model: A Test of Certain Interaction Hypotheses. *Social Psychology Quarterly*, 48, 366-373.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, N. J.: Prentice-Hall.
- Baumeister, R. F., & Vohs, K. D. (2007). Self-regulation, ego depletion, and motivation. *Social and Personality Psychology Compass*, 1, 115-128.
- Borsari, B., & Carey, K. B. (2001). Peer influences on college drinking: A review of the research. *Journal of Substance Abuse*, 13, 391-424.
- Borsari, B., & Carey, K. B. (2003). Descriptive and injunctive norms in college drinking: A meta-analytic integration. *Journal of Studies on Alcohol*, 64, 331-341.

- Brehm, J. W. (1966). *A theory of psychological reactance*. New York: Academic Press.
- Burger, J. M., & Shelton, M. (2011). Changing everyday health behaviors through descriptive norm manipulations. *Social Influence, 6*, 69 - 77.
- Burger, J. M., Bell, H., Harvey, K., Johnson, J., Stewart, C., Dorian, K., et al. (2010). Nutritious or Delicious? the Effect of Descriptive Norm Information on Food Choice. *Journal of Social and Clinical Psychology, 29*, 228-242.
- Cesario, J., Grant, H., & Higgins, E. T. (2004). Regulatory Fit and Persuasion: Transfer From "Feeling Right." *Journal of Personality and Social Psychology, 86*, 388-404.
- Cesario, J., Higgins, E. T., & Scholer, A. A. (2008). Regulatory Fit and Persuasion: Basic Principles and Remaining Questions. *Social and Personality Psychology Compass, 2*, 444-463.
- Cho, H. (2006). Influences of norm proximity and norm types on binge and non-binge drinkers: Examining the under-examined aspects of social norms interventions on college campuses. *Journal of Substance Use, 11*, 417-429.
- Cialdini, R. B. (1984). *Influence: The psychology of persuasion* (Rev. ed.). New York: HarperCollins Publishers.
- Cialdini, R. B. (2005). Don't throw in the towel: Use social influence research. *Observer*, from <http://www.psychologicalscience.org/observer/getarticle.cfm?id=1762>
- Cialdini, R. B. (2007). Descriptive social norms as underappreciated sources of social control. *Psychometrika, 72*, 263-268.
- Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. *Annual Review of Psychology, 55*, 591-621.
- Cialdini, R. B., & Trost, M. R. (1998). *Social Influence: Social norms, Conformity and Compliance* (4 ed. Vol. 2). New York: Oxford university press.
- Cialdini, R. B., Demaine, L. J., Sagarin, B. J., Barrett, D. W., Rhoads, K., & Winter, P. L. (2006). Managing social norms for persuasive impact. *Social Influence, 1*, 3-15.
- Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology, 58*, 1015-1026.
- Clapp, J. D., Lange, J. E., Russell, C., Shillington, A., & Voas, R. B. (2003). A failed norms social marketing campaign. *Journal of Studies on Alcohol, 64*, 409-414.
- Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*, 155-159.
- Conner, M., & McMillan, B. (1999). Interaction effects in the theory of planned behaviour: Studying cannabis use. *British Journal of Social Psychology, 38*, 195-222.

- Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: Design and analysis issues for field settings*. Boston, MA: Houghton Mifflin.
- Cooper, M. L. (2002). Alcohol Use and Risky Sexual Behavior among College Students and Youth: Evaluating the Evidence. *Journal of Studies on Alcohol and Drugs* (Supplement 14), 101-117.
- Crawford, L. E., & Cacioppo, J. T. (2002). Learning Where to Look for Danger: Integrating Affective and Spatial Information. *Psychological Science* (Wiley-Blackwell), 13, 449-453.
- Crawford, L. A., & Noval, K. B. (2010). Beliefs about alcohol and the college experience as moderators of the effects of perceived drinking norms on student alcohol use. *Journal of Alcohol and Drugs Education*, 54, 69-86.
- De Vries, M., Holland, R.W., & Witteman, C. (2008). Fitting decisions: Mood and Intuitive versus Deliberative Decision-Strategy. *Cognition and Emotion*, 22, 931-943.
- DeJong, W., Kessel Schneider, S., Gomberg Towvim, L., Murphy, M. J., Doerr, E. E., Simonsen, N. R., et al. (2006). A multisite randomized trial of social norms marketing campaigns to reduce college student drinking. *Journal of Studies on Alcohol and Drugs*, 67, 868-879.
- Deutsch, M., & Gerard, H. B. (1955). A study of normative and informational social influences upon individual judgment. *The Journal of Abnormal and Social Psychology*, 51, 629-636.
- Dijksterhuis, A., & Aarts, H. (2003). On Wildebeests and Humans: The Preferential Detection of Negative Stimuli. *Psychological Science* (Wiley-Blackwell), 14, 14.
- Fishbach, A., & Zhang, Y. (2008). Together or apart: When goals and temptations complement versus compete. *Journal of Personality and Social Psychology*, 94, 547-559.
- Fishbach, A., Friedman, R. S., & Kruglanski, A. W. (2003). Leading us not into temptation: Momentary allurements elicit overriding goal activation. *Journal of Personality and Social Psychology*, 84, 296-309.
- Fishbach, A., Zhang, Y., & Koo, M. (2009). The dynamics of self-regulation. *European Review of Social Psychology*, 20, 315 - 344.
- Fishbein, M., & Cappella, J. N. (2006). The role of theory in developing effective health communications. *Journal of Communication*, 56, S1-S17.
- George, S., Rogers, R. D., & Duka, T. (2005). The acute effect of alcohol on decision making in social drinkers. *Psychopharmacology*, 182, 160-169.

- Giancola, P. R. (2002). Alcohol-Related Aggression during the College Years: Theories, Risk Factors and Policy Implications. *Journal of Studies on Alcohol and Drugs, Supplement 14*.
- Gibbons, F. X., Gerrard, M., Ouellette, J. A., & Burzette, R. (1998). Cognitive antecedents to adolescent health risk: Discriminating between behavioral intention and behavioral willingness. *Psychology & Health, 13*, 319-339.
- Gilbert, D. T. (1991). How mental systems believe. *American Psychologist, 46*, 107-119.
- Glasman, L. R., & Albarracín, D. (2006). Forming attitudes that predict future behavior: A meta-analysis of the attitude-behavior relation. *Psychological Bulletin, 132*, 778-822.
- Göckeritz, S., Schultz, P. W., Rendón, T., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2009). Descriptive normative beliefs and conservation behavior: The moderating roles of personal involvement and injunctive normative beliefs. *European Journal of Social Psychology, 40*, 514-523.
- Godin, G., & Kok, G. (1996). The theory of planned behavior: a review of its applications to health-related behaviors. *American journal of health promotion, 22*, 87-98.
- Goldsmith, D. J., & Fitch, K. (1997). The Normative Context of Advice as Social Support. *Human Communication Research, 23*, 454-476.
- Goldstein, Noah J., Cialdini, Robert B., & Griskevicius, V. (2008). A Room with a Viewpoint: Using Social Norms to Motivate Environmental Conservation in Hotels. *Journal of consumer research, 35*, 472-482.
- Granfield, R. (2005). Alcohol use in college: Limitations on the transformation of social norms. *Addiction Research & Theory, 13*, 281-292.
- Griskevicius, V., Goldstein, N. J., Mortensen, C. R., Cialdini, R. B., & Kenrick, D. T. (2006). Going along versus going alone: When fundamental motives facilitate strategic (non)conformity. *Journal of Personality and Social Psychology, 91*, 281-294.
- Grube, J. W., Morgan, M., & McGree, S. T. (1986). Attitudes and normative beliefs as predictors of smoking intentions and behaviours: A test of three models. *British Journal of Social Psychology, 25*, 81-93.
- Gudykunst, W. B., Matsumoto, Y., Ting-Toomey, S., Nishida, T., Kim, K., & Heyman, S. A.M. (1996). The Influence of Cultural Individualism-Collectivism, Self Construals, and Individual Values on Communication Styles Across Cultures. *Human Communication Research, 22*, 510-543.
- Herman, C. P., Roth, D. A., & Polivy, J. (2003). Effects of the Presence of Others on Food Intake: A Normative Interpretation. *Psychological Bulletin, 129*, 873-886.

- Hermans, R. C. J., Engels, R. C. M. E., Larsen, J. K., & Herman, C. P. (2009). Modeling of palatable food intake. The influence of quality of social interaction. *Appetite*, 52, 801-804.
- Higgins, E. T., Idson, L. C., Freitas, A. L., Spiegel, S., & Molden, D. C. (2003). Transfer of value from fit. *Journal of Personality and Social Psychology*, 84, 1140-1153.
- Houben, K., & Jansen, A. (2010). Training inhibitory control. A recipe for resisting sweet temptations. *Appetite*, 56(2), 345-349.
- Inquisit 3.032 [Computer software]. (2009). Seattle, WA: Millisecond Software.
- Jacobson, R. P., Mortensen, C. R., & Cialdini, R. B. (2011). Bodies obliged and unbound: Differentiated response tendencies for injunctive and descriptive social norms. *Journal of Personality and Social Psychology*, 100, 433-448.
- Kahneman, D., & Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica*, 47, 263-291.
- Keizer, K., Lindenberg, S., Steg, L. (2008). The spreading of disorder. *Science*, 322, 1681-1685.
- Kim, H., & Markus, H. R. (1999). Deviance or uniqueness, harmony or conformity? A cultural analysis. *Journal of Personality and Social Psychology*, 77, 785-800.
- Lally, P., Bartle, N., & Wardle, J. (2011). Social norms and diet in adolescents. *Appetite*, 57, 623-627.
- Lane, S. O., Cherek, D. R. J., Pietras, C., & Tcheremissine, O. V. (2004). Alcohol effects on human risk taking. *Psychopharmacology*, 172, 68-77.
- Lapinski, M. K., Rimal, R. N., DeVries, R., & Lee, E. L. (2007). The Role of Group Orientation and Descriptive Norms on Water Conservation Attitudes and Behaviors. *Health Communication*, 22, 133-142.
- Larimer, M. E., Lydum, A. R., Anderson, B. K., & Turner, A. P. (1999). Male and Female Recipients of Unwanted Sexual Contact in a College Student Sample: Prevalence Rates, Alcohol Use, and Depression Symptoms. *Sex Roles*, 40, 295-308.
- Larimer, M. E., Turner, A. P., Mallett, K. A., & Geisner, I. M. (2004). Predicting Drinking Behavior and Alcohol-Related Problems Among Fraternity and Sorority Members: Examining the Role of Descriptive and Injunctive Norms. *Psychology of Addictive Behaviors*, 18, 203-212.
- LaBrie, J. W., Hummer, J. F., & Neighbors, C. (2008). Self-consciousness moderates the relationship between perceived norms and drinking in college students. *Addictive Behaviors*, 33, 1529-1539.

- Levin, I. P., Schneider, S. L., & Gaeth, G. J. (1998). All Frames Are Not Created Equal: A Typology and Critical Analysis of Framing Effects. *Organizational Behavior and Human Decision Processes*, 76, 149-188.
- McGuire, W. J. (1985). *Attitudes and attitude change*. (Vol. 2). New York: Random House.
- Mollen, S., Ruiter, R. A. C., & Kok, G. (2010). Current issues and new directions in Psychology and Health: What are the oughts? The adverse effects of using social norms in health communication. *Psychology & Health*, 25, 265 - 270.
- National Health Service. (2004). About 5 a day. Retrieved January 30, 2009, from <http://www.5aday.nhs.uk/whyeat5aday/about5aday.aspx>
- National Health Service. (2009). Why change4life? Retrieved January 30, 2009, from <http://www.nhs.uk/change4life/pages/why.aspx>
- Neighbors, C., Geisner, I. M., & Lee, C. M. (2008). Perceived marijuana norms and social expectancies among entering college student marijuana users. *Psychology of Addictive Behaviors*, 22, 433-438.
- Neighbors, C., Lee, C. M., Lewis, M. A., Fossos, N., & Larimer, M. E. (2007). Are social norms the best predictor of outcomes among heavy-drinking college students? *Journal of Studies on Alcohol and Drugs*, 68, 556-565.
- Neighbors, C., O'Connor, R. M., Lewis, M. A., Chawla, N., Lee, C. M., & Fossos, N. (2008). The relative impact of injunctive norms on college student drinking: The role of reference group. *Psychology of Addictive Behaviors*, 22, 576-581.
- Newcomb, M. D., Rabow, J., & Hernandez, A. C. R. (1992). A Cross-National Study of Nuclear Attitudes, Normative Support, and Activist Behavior: Additive and Interactive Effects. *Journal of Applied Social Psychology*, 22, 780-800.
- Nolan, J. M., Schultz, P. W., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2008). Normative social influence is underdetected. *Personality and Social Psychology Bulletin*, 34, 913-923.
- Papies, E. K., Stroebe, W., & Aarts, H. (2008). Healthy Cognition: Processes of Self-Regulatory Success in Restrained Eating. *Personality and Social Psychology Bulletin*.
- Perkins, H. W., & Berkowitz, A. D. (1986). Perceiving the community norms of alcohol use among students: Some research implications for campus alcohol education programming. *International Journal of the Addictions*, 21, 961-976.
- Peters, G.-J. Y., Kok, G., & Abraham, C. (2008). Social cognitive determinants of ecstasy use to target in evidence-based interventions: a meta-analytical review. *Addiction*, 103, 109-118.

- Petty, R. E., & Cacioppo, J. T. (1986). *The elaboration likelihood model of persuasion* (Vol. 19). New York: Academic Press.
- Prentice, D. A. (2008). *Mobilizing and weakening peer influence as mechanisms for changing behavior*. New York: Guildford Press.
- Prentice, D. A., & Miller, D. T. (1993). Pluralistic ignorance and alcohol use on campus: Some consequences of misperceiving the social norm. *Journal of Personality and Social Psychology*, 64, 243-256.
- Rabow, J., Neuman, C. A., & Hernandez, A. C. R. (1987). Contingent Consistency in Attitudes, Social Support and the Consumption of Alcohol: Additive and Interactive Effects. *Social Psychology Quarterly*, 50, 56-63.
- Reno, R. R., Cialdini, R. B., & Kallgren, C. A. (1993). The transsituational influence of social norms. *Journal of Personality and Social Psychology*, 64, 104-112.
- Rimal, R. N. (2008). Modeling the relationship between descriptive norms and behaviors: A test and extension of the theory of normative social behavior (TNSB). *Health Communication*, 23, 103-116.
- Rimal, R. N., & Lapinski, M. K. (2008). *Social norms*. Malden, MA: Wiley-Blackwell.
- Rimal, R. N., & Real, K. (2005). How Behaviors are Influenced by Perceived Norms. *Communication Research*, 32, 389-414.
- Rimal, R. N., Lapinski, M. K., Cook, R. J., & Real, K. (2005). Moving toward a theory of normative influences: How perceived benefits and similarity moderate the impact of descriptive norms on behaviors. *Journal of Health Communication*, 10, 433-450.
- Rinck, M., & Becker, E. S. (2007). Approach and avoidance in fear of spiders. *Journal of Behavior Therapy and Experimental Psychiatry*, 38, 105-120.
- Rivis, A., & Sheeran, P. (2003). Descriptive Norms as an Additional Predictor in the Theory of Planned Behaviour: A Meta-Analysis. *Current Psychology: Developmental, Learning, Personality, Social*, 22, 218-233.
- Rogers, E. M. (1962). *Diffusion of innovations*. New York: Free Press.
- Schroeder, C. M., & Prentice, D. A. (1998). Exposing Pluralistic Ignorance to Reduce Alcohol Use Among College Students. *Journal of Applied Social Psychology*, 28, 2150-2180.
- Schultz, P. W., Khazian, A. M., & Zaleski, A. C. (2008). Using normative social influence to promote conservation among hotel guests. *Social Influence*, 3, 4-23.



- Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological Science, 18*, 429-434.
- Schwartz, B. (2000). Self-determination: The tyranny of freedom. *American Psychologist, 55*, 79-88.
- Schwarz, N., & Clore, G. L. (2007). Feelings and phenomenal experiences. In Kruglanski, A. & Higgins, E. T. (Eds.) *Social psychology. Handbook of basic principles*. (pp. 385-407) New York: Guilford.
- Sheeran, P. (2002). Intention-behavior relations: A Conceptual and empirical review. *European review of social psychology, 12*, 1-36.
- Sheeran, P., & Taylor, S. (1999). Predicting Intentions to Use Condoms: A Meta-Analysis and Comparison of the Theories of Reasoned Action and Planned Behavior. *Journal of Applied Social Psychology, 29*, 1624-1675.
- Sieverding, M., Decker, S., & Zimmermann, F. (2010). Information About Low Participation in Cancer Screening Demotivates Other People. *Psychological Science, 21*, 941-943.
- Smith-McLallen, A., & Fishbein, M. (2008). Predictors of intentions to perform six cancer-related behaviours: Roles for injunctive and descriptive norms. *Psychology, Health & Medicine, 13*, 389-401.
- Stichting Voedingscentrum Nederland. (2008). Groente en fruit. July 17, 2008. Retrieved December 5, 2008, from <http://www.voedingscentrum.nl/nl/acties-achtergronden/acties/groenteenfruit.aspx>
- Stok, F. M., de Ridder, D. T. D., de Vet, E., & de Wit, J. B. F. Minority talks: The influence of descriptive social norms on fruit intake. *Psychology & Health, 27*, 956-970.
- Terry, D. J., & Hogg, M. A. (1996). Group norms and the attitude-behavior relationship: A role for group identification. *Personality and Social Psychology Bulletin, 22*, 776-793.
- Tesser, A., Campbell, J., & Mickler, S. (1983). The role of social pressure, attention to the stimulus, and self-doubt in conformity. *European Journal of Social Psychology, 13*, 217-233.
- Turner, J., Perkins, H. W., & Bauerle, J. (2008). Declining Negative Consequences Related to Alcohol Misuse Among Students Exposed to a Social Norms Marketing Intervention on a College Campus. *Journal of American College Health, 57*, 85-94.

- Whittingham, J.R.D., Ruiter, R.A.C., Bolier, L., Lemmers, L., Van Hasselt, N., & Kok, G. (2009). Avoiding counterproductive results: An experimental pretest of a harmreduction intervention on attitude toward party drugs among users and nonusers. *Substance Use and Misuse*, 44, 532-547
- Whittingham, J.R.D., Ruiter, R.A.C., Zimbile, F., & Kok, G. (2008). Experimental pretesting of public health campaigns: A case study. *Journal of Health Communication*, 13, 216-229.
- Wechsler, H., Nelson, T. F., Lee, J. E., Seibring, M., Lewis, C., & Keeling, R. P. (2003). Perception and reality: A national evaluation of social norms marketing interventions to reduce college students' heavy alcohol use. *Quarterly Journal of Studies on Alcohol*, 64, 484-494.
- Wood, P. K., Sher, K. J., Erickson, D. J., & DeBord, K. A. (1997). Predicting academic problems in college from freshman alcohol involvement. *Journal of Studies on Alcohol and Drugs*, 58, 200-210.
- World Health Organization (2003). Obesity and Overweight. Retrieved December 6, 2012, from <http://www.who.int/dietphysicalactivity/publications/facts/obesity/en/#>
- World Health Organization (2011). *Obesity and Overweight*. Retrieved 08-05-2012, from <http://www.who.int/mediacentre/factsheets/fs311/en/>.
- Yun, D., & Silk, K. J. (2011). Social norms, self-identity, and attention to social comparison information in the context of exercise and healthy diet behavior. *Health Communication*, 26, 275-285.



DANKWOORD



Om te kunnen overleven op de uitgestrekte Savanne die promoveren heet, is het essentieel dat je een goede kudde om je heen hebt die je beschermt, aanmoedigt en bij staat met raad en daad, daar waar nodig. De afgelopen jaren heb ik, bijgestaan door een zeer bijzondere en dierbare kudde, de hele Savanne doorkruist. Deze tocht ging over bergen en dalen en heeft uiteindelijk het huidige proefschrift opgeleverd. Het was een mooie en enerverende tocht die ik niet had kunnen maken zonder een aantal hele bijzondere personen om mij heen, wie ik veel dank verschuldigd ben.

Het grote voordeel van het leven in een kudde is dat je samen sterk staat en dat op momenten dat je instincten zeggen dat je moet rennen, anderen om je heen een baken van rust zijn en je laten zien dat er geen enkel gevaar is om voor te vluchten. Voor mij waren dat de afgelopen vier jaar Rob en Gerjo. Op momenten dat het voor mij soms leek alsof er elk moment een krokodil uit het water op kon doemen waren jullie een oase van rust.

De afgelopen vier jaar heb ik het grootste gedeelte van mijn tijd doorgebracht op de UNS 5. Hier heb ik met ontzettend veel plezier gewerkt en heel veel lol gehad met mijn collega's tijdens, maar ook na het werk. Twee hiervan staan tijdens mijn verdediging naast mij. Wat erg symbolisch is, want voor mijn gevoel hebben zij gedurende de afgelopen vier jaar altijd naast mij gestaan. Hans en Loes, ervaren wegwijzers op de academische Savanne, goede vrienden en mijn allerliefste paranimfen. Op de UNS 5 deelde ik een lange tijd een stukje Savanne met Dilana. Samen waren we soms heerlijk onproductief. Om motivatie op te doen keken we regelmatig naar dezelfde inspirerende kuddeleider, die ons altijd het gevoel kon geven dat we aan de *winning* hand waren.

Hoewel de verleiding voor een kuddedier erg groot kan zijn om bij je oude vertrouwde groep te blijven is het soms ook goed om een tochtje te maken van de ene naar de andere groene weide. Deze groene weide lag voor mij aan de andere kant van de oceaan in Baltimore. Daar deed ik samen met Rajiv onderzoek naar het gedrag van andere kuddedieren in hun natuurlijke habitat. In Baltimore heb ik ontzettend veel geleerd, kansen gekregen en een van de meest lieve mensen in de wetenschap ontmoet. Rajiv I am very grateful for all that you have thought me, and the chances you have given me. You are a great mentor and a great person. I hope that we will continue working together in the future and have a chance to go on more bike trips through the city of Amsterdam.

Bij het maken van een grote tocht is het ook belangrijk om af en toe een slokje te drinken bij de waterpoel. In de Nijmeegse kudde bevinden zich mijn meest geliefde drinkmaatjes. Hans, Julie, Linda, Marieke en Marlieke, ik hoop dat we samen nog vaak tripjes zullen maken naar de waterpoel om onze dorst te lessen en bij te praten over dingen die we op ons aller reizen meemaken. Mijn allergrootste maatje in deze kudde is Marlieke, wiens vriendschap mijn tocht vele malen mooier en leuker heeft gemaakt.

Degenen zonder wie ik nooit aan deze tocht was begonnen, zijn ons pap en ons mam. Jullie hebben me de basis gegeven waar vanuit ik kon beginnen aan mijn reis. Altijd zijn jullie er voor mij, jullie warmte en liefde maakt(e) alles zo veel eenvoudiger.

Als laatste dan Suus wiens liefde, steun en vriendschap allesomvattend is. Met wie ik van Limburg naar Baltimore ging en weer terug. Nu samen in Amsterdam om ons beider dromen te verwezenlijken.







## CURRICULUM VITAE



Saar Mollen was born on the 13<sup>th</sup> of March 1983, in Valkenswaard, the Netherlands. In 2000 she received her Hoger Algemeen Voortgezet Onderwijs (HAVO) diploma from Peellandcollege Deurne. After one year of studying Applied Psychology at the Fontys Hogeschool in Eindhoven, she began studying Psychology at the Radboud University in Nijmegen. In 2004 she received her Bachelor's degree in Psychology, with a focus on Applied Social Psychology. In 2007 she graduated and obtained her Research Master's degree in Behavioral Science (direction Psychological Science) at the same university. Shortly after her graduation she began her work at the Faculty of Psychology and Neuroscience as a PhD candidate on the research presented in this thesis. She conducted parts of her research in collaboration with Dr. Rajiv Rimal at Johns Hopkins University. She currently holds a position as an Assistant Professor at the department of Persuasive Communication at the University of Amsterdam.



The “Kurt Lewin Institute Dissertation Series” started in 1997. Since 2011 the following dissertations have been published:

- 2011-1: Elze Ufkes: *Neighbor-to-neighbor conflicts in multicultural neighborhoods*
- 2011-2: Kim van Erp: *When worlds collide. The role of justice, conflict and personality for expatriate couples' adjustment*
- 2011-3: Yana Avramova: *How the mind moods*
- 2011-4: Jan Willem Bolderdijk: *Buying people: The persuasive power of money*
- 2011-5: Nina Regenberg: *Sensible Moves*
- 2011-6: Sonja Schinkel: *Applicant reactions to selection events: Interactive effects of fairness, feedback and attributions*
- 2011-7: Suzanne Oosterwijk: *Moving the Mind: Embodied Emotion Concepts and their Consequences*
- 2011-8: Ilona McNeill: *Why We Choose, How We Choose, What We Choose: The Influence of Decision Initiation Motives on Decision Making*
- 2011-9: Shaul Shalvi: *Ethical Decision Making: On Balancing Right and Wrong*
- 2011-10: Joel Vuolevi: *Incomplete Information in Social Interactions*
- 2011-11: Lukas Koning: *An instrumental approach to deception in bargaining*
- 2011-12: Petra Tenbült: *Understanding consumers' attitudes toward novel food technologies*
- 2011-13: Ashley Hoben: *An Evolutionary Investigation of Consanguineous Marriages*
- 2011-14: Barbora Nevicka: *Narcissistic Leaders: The Appearance of Success*
- 2011-15: Annemarie Loseman: *Me, Myself, Fairness, and I: On the Self-Related Processes of Fairness Reactions*
- 2011-17: Francesca Righetti: *Self-regulation in interpersonal interactions: Two regulatory selves at work*
- 2012-1: Roos Pals: *Zoo-ming in on restoration: Physical features and restorativeness of environments*
- 2012-2: Stephanie Welten: *Concerning Shame*
- 2012-3: Gerben Langendijk: *Power, Procedural Fairness & Prosocial Behavior*
- 2012-4: Janina Marguc: *Stepping Back While Staying Engaged: On the Cognitive Effects of Obstacles*
- 2012-5: Erik Bijleveld: *The unconscious and conscious foundations of human reward pursuit*

- 2012-6: Maarten Zaal: *Collective action: A regulatory focus perspective*
- 2012-7: Floor Kroese: *Tricky treats: How and when temptations boost self-control*
- 2012-8: Koen Dijkstra: *Intuition Versus Deliberation: the Role of Information Processing in Judgment and Decision Making*
- 2012-9: Marjette Slijkhuis: *A Structured Approach to Need for Structure at Work*
- 2012-10: Monica Blaga: *Performance attainment and intrinsic motivation: An achievement goal approach*
- 2012-11: Anita de Vries: *Specificity in Personality Measurement*
- 2012-12: Bastiaan Rutjens: *Start making sense: Compensatory responses to control- and meaning threats*
- 2012-13: Marleen Gillebaart: *When people favor novelty over familiarity and how novelty affects creative processes*
- 2012-14: Marije de Goede: *Searching for a match: The formation of Person-Organization fit perceptions*
- 2012-15: Liga Klavina: *They steal our women: Outgroup Members as Romantic Rivals*
- 2012-16: Jessanne Mastop: *On postural reactions: Contextual effects on perceptions of and reactions to postures*
- 2012-17: Joep Hofhuis: *Dealing with Differences: Managing the Benefits and Threats of Cultural Diversity in the Workplace*
- 2012-18: Jessie de Witt Huberts: *License to Sin: A justification-based account of self-regulation failure*
- 2012-19: Yvette van Osch: *Show or hide your pride*
- 2012-20: Laura Dannenberg: *Fooling the feeling of doing: A goal perspective on illusions of agency*
- 2012-21: Marleen Redeker: *Around Leadership: Using the Leadership Circumplex to Study the Impact of Individual Characteristics on Perceptions of Leadership*
- 2013-1: Annemarie Hiemstra: *Fairness in Paper and Video Resume Screening*
- 2013-2: Gert-Jan Lelieveld: *Emotions in Negotiations: The Role of Communicated Anger and Disappointment*
- 2013-3: Saar Mollen: *Fitting in or Breaking Free? On Health Behavior, Social Norms and Conformity*





